PART III.

THE FISHERIES OF MASSACHUSETTS.

By A. HOWARD CLARK.

MATERIAL FOR WHALE FISHERY AND FOR GLOUCESTER DISTRICT GATHERED BY A. HOWARD CLARK; FOR NEWBURYPORT, SALEM, MARBLEHEAD, BOSTON, PLYMOUTH, NEW BEDFORD, AND FALL RIVER DISTRICTS, BY W. A. WILCOX; FOR BARNSTABLE, NANTUCKET, AND EDGARTOWN DISTRICTS, BY F. W. TRUE.

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PART III.

THE FISHERIES OF MASSACHUSETTS.

A.—THE COAST OF MASSACHUSETTS AND ITS FISHERIES.

54. OUTLINE AND PRESENT CONDITION OF THE FISHERIES.

Massachusetts is the center of the sea-fisheries of the United States. From here are carried on all the various branches of the bank and shore cod, haddock, and halibut fisheries, the mackerel fishery, menhaden and whale fisheries, lobster, oyster, clam, and other fisheries; and numerous industries related to them have their headquarters here.

The coast of the State possesses excellent harbors and peculiar facilities for carrying on an extensive maritime business. For more than two hundred and fifty years the bays have abounded in fish of many kinds, and the inhabitants have looked to the sea as a means of support. Cape Cod, "the right arm of the State," has always been the home of hardy fishermen, and Cape Ann, on the northern side of Massachusetts Bay, is the headquarters of the largest fishing fleet belonging to any port in the country.

For convenience the coast towns are divided into eleven districts, corresponding to the eleven customs districts of the State. Commencing at the New Hampshire line, the first district is that of Newburyport, which includes the towns of Newburyport and Ipswich. Next in geographical order is the Gloucester district, embracing Essex, Rockport, Gloucester, and Manchester. The Salem district comes next, and includes Beverly and Salem. The other districts are Marblehead, including Marblehead, Swampscott, Nahant, and Lynn; Boston, including towns from Boston to Cohasset on the south shore of Massachusetts Bay; Plymouth, embracing Scituate, Duxbury, Kingston, and Plymouth; Barnstable, including Provincetown and other places in Barnstable County; Nantucket, embracing the fisheries of Nantucket Island; Edgartown, including Martha's Vineyard, No Man's Land, and the Elizabeth Isles; New Bedford, embracing all towns from Wareham to Westport; and the Fall River district, which embraces the fisheries of the Taunton and adjacent rivers, and in which is included the fishery for shad in the Connecticut River at Holyoke.

In the early history of the colonies, whales were abundant near shore and were easily captured by small boats. Later, as they became scarce inshore, they were pursued by vessels, and in time the whaling grounds extended to all parts of the world. The whaling fleet in the United States was largest in 1846, when 722 vessels were engaged in that business. Of this number 470 were owned in seventeen ports of Massachusetts, and the rest in towns of other New England States, New York, and Delaware. New Bedford owned 256, Nantucket 74, Fairhaven 48, and other towns from 1 to 23 sail. The fleet in the United States on January 1, 1880, numbered 170 sail, owned as follows: New Bedford, 125; Provincetown, 19; Boston, 5; Dartmouth, 2; Marion, 2; Westport, 3, and Edgartown 6—making a total of 162 in Massachusetts; New London, Conn., 5; and San Francisco, Cal., 3.

The products of the whale fishery were most profitable in 1854, when the total receipts from the American fleet were valued at $10,802,594.20, and included 2,315,924 gallons of sperm oil, 10,074,866 gallons of whale oil, and 3,445,200 pounds of whalebone. A large part of this enormous product was the result of Massachusetts industry. The capital now invested in this fishery in Massachusetts, including the value of vessels, outfit, shore property, and circulating capital, is $4,411,150. The value of products in 1879 was $2,089,337, and the number of persons employed 4,300.

Of the 2,099 vessels employed in the cod and mackerel fisheries in the United States in 1874, 1,026 of 49,578 tons belonged to Massachusetts. Accurate statistics of the combined fisheries of the State for any given year cannot be obtained. From the reports of the State inspector of pickled fish, we learn that the mackerel fleet in the United States in 1851 numbered 940 sail of 59,410 tons, and employed 9,993 men and boys. Of this fleet, 853 vessels of 53,705 tons were owned in Massachusetts, and the rest in other States.

United States mackerel fleet in 1851.

Where owned.	Vessels.	Tonnage.	Number of men and boys.
MASSACHUSETTS.			
Boston	7	596	85
Beverly	12	761	97
Barnstable	28	1,918	339
Brewster	4	259	47
Charlestown	2	74	14
Chatham	19	1,346	230
Cohasset	44	2,885	561
Dartmouth	1	117	16
Dennis	47	3,096	585
Eastham	3	170	23
Essex	1	71	10
Gloucester	241	13,639	2,326
Harwich	48	3,231	577
Hingham	37	2,492	491
Lynn	4	161	33
Manchester	1	45	3
Marblehead	1	30	5
Martha's Vineyard	6	420	65
Nantucket	3	168	30
Newburyport	67	4,343	707
Orleans	5	336	54
Plymouth	6	561	65
Provincetown	60	4,332	688
Rockport	43	1,527	283
Salem	1	80	9
Scituate	13	715	119
Salisbury	4	305	48
Truro	52	3,626	581
Wellfleet	79	5,411	852
Yarmouth	14	990	169
	853	53,705	9,112
OTHER STATES.			
Maine	47	3,019	446
New Hampshire	8	515	84
Rhode Island	7	479	71
Connecticut	23	1,551	255
Maryland	2	141	25
	940	59,410	9,993

The total amount of mackerel inspected in Massachusetts from 1808 to 1880 was about 12,120,000 barrels, more than one-fourth of which were packed in Gloucester. The largest amounted inspected in any single year was 383,658 barrels in 1831. The only other years in which the inspection exceeded 300,000 barrels were 1830, 1848, 1851, 1863, and 1870. This fishery in 1851 was distributed among a large number of fishing ports in the State, but like the cod and other fisheries is now centered in a few leading ports.

The fresh-halibut fishery has always had its headquarters at Gloucester. It began about the year 1830, by the visit of vessels to George's Banks. In 1844, the fleet at this port numbered 30 sail; in 1848, 63 sail; and in 1852, 75 sail. The value of halibut taken in 1851 was about $60,000. The fleet in 1879 numbered about 50 sail, and the receipts at Gloucester were worth to the fishermen upwards of $309,000.

The fishery for cod on George's, Western, and Grand Banks has been of first importance to Massachusetts, and has employed large fleets of vessels and thousands of men. The Grand Bank fishing has been prosecuted from Marblehead, Gloucester, and other ports for over 200 years, and trips were made to George's, by Marblehead vessels, as early as 1748. At that time the vessels were not generally anchored on George's, but drifted about while fishing. Gloucester vessels in 1821 are said to have been the first to anchor on this bank and to begin the active prosecution of a fishery that yields the best of cod, and which for many years has annually employed from 100 to 200 sail of vessels.

The oyster industry of the State in 1879 employed 896 persons, and a capital of $303,175. The value of this industry includes $41,800 worth of native oysters and $363,750 enhancement in the value of oysters brought from the South and transplanted in this region.

The menhaden fishery in the same year employed 271 persons, and a capital of $179,105. The value of the products, including $20,477 worth of menhaden sold to factories outside the State, was $61,769.

STATISTICAL SUMMARY FOR 1879.—The tabulated statement herewith presented shows in detail the census statistics of the Massachusetts fisheries. The number of persons employed is 20,117; the capital invested is $14,334,450; and the value of the products in first hands is $8,141,750.

These statistics show the production but do not exhibit the trade in fishery products, great quantities of fish and oil being received in Massachusetts from Maine and the British Provinces, and from here distributed throughout the country. The production is for the year 1879, and is estimated to have been 10 per cent. less in quantity and 20 per cent. less in value than the catch for 1880 or for 1881.

The table shows the number of persons employed in the several branches of the fishing industry, viz, the number of vessel-fishermen, the number of boat-fishermen, including those engaged in fishing with weirs and other stationary apparatus, and the number of factory hands, or those employed in the preparation of fish-oil and other products. The total number of persons actively employed in the industry is 20,117. To this number may be added about 5,000 persons engaged in manufacturing nets, hooks, lines, rigging, sails, spars, fish boxes and barrels, and in the building of vessels and boats used in the fisheries. Including the families of fishermen and of those engaged in preparing the products, it is estimated that 100,000 persons in Massachusetts rely upon this industry for their support.

The quantity of apparatus used in the fisheries is also shown, including the number of vessels and their tonnage, the number of boats in vessel and shore fisheries, the number of gill-nets, purse-seines, and drag-seines, and the number of weirs and other fishing traps. Sailing craft of over 5

tons burden having custom-house papers are classed as vessels; all other craft are classed as boats. The total number of vessels actively employed is 1,007, aggregating 81,080.49 tons. Forty-seven additional fishing vessels, aggregating 2,151.68 tons, were idle throughout the year 1879, but actively employed in 1880. Several vessels not included in these statistics started on fishing trips in 1879, but never returned. The general distribution of the fleet in the different fisheries was as follows: 796 vessels, of 42,090.81 tons, in the food-fish fishery; 3 vessels, of 27.19 tons, in the lobster fishery; 6 vessels, of 557.54 tons, in the oyster fishery; 35 vessels, of 1,269.70 tons, in the menhaden fishery; 161 vessels, of 36,786.51 tons, in the whale fishery; 1 vessel, of 84.65 tons, in the Antarctic fur-seal fishery; and 5 vessels, of 264.09 tons, in the squid fishery. Some of those in the food-fish fishery were engaged for a part of the year in the oyster or the lobster fishery.

The amount of capital dependent upon the industry is also shown, including the value of vessels, boats, gear and outfit, netting, traps, wharves, shorehouses and fixtures, factories and their apparatus, and the amount of cash capital required to conduct the business. The value of vessels includes the value of hull, spars, rigging, anchors, and cables; the gear is the fishing apparatus, exclusive of boats, nets, and seines; and the outfit is the furniture of the vessel, the private equipment of the fishermen, and the provisions, salt, ice, bait, and barrels used in the vessels during the fishing season. The total capital in the business is $14,334,450, distributed as follows: Vessels, $3,171,189; boats, $351,736; gear and outfit, $3,159,055; netting, $264,468; traps, $105,402; shorehouses, and fixtures, $2,875,600; factories and their apparatus, $677,000; cash capital, $3,730,000.

The total yield of fish by the fisheries of Massachusetts, reduced to the original weight as taken from the water, is 341 935,982 pounds, and the quantity of various species is estimated as follows:

Kind.	Quantity.	Kind.	Quantity.	Kind.	Quantity.	Kind.	Quantity.
	Pounds.		*Pounds.*		*Pounds.*		*Pounds.*
Alewives	3, 751, 059	Cunners	160, 500	Halibut	14, 205, 916	Scup	1, 022, 180
Bass, sea	80, 500	Cusk	989, 194	Herring	7, 794, 789	Shad	164, 524
Bass, striped	287, 955	Eels	395, 100	Mackerel	61, 422, 668	Smelts	35, 006
Blue-fish	4, 273, 841	Flounders	571, 470	Menhaden	26, 066, 077	Squeteague	103, 310
Bonito	97, 000	Frost-fish	67, 434	Perch	33, 574	Sturgeon	9, 650
Butterfish	5, 000	Haddock	24, 092, 890	Pollock	4, 751, 495	Sword-fish	731, 950
Cod	172, 216, 955	Hake	8, 437, 749	Salmon	220	Tautog	373, 335

Mixed species, including those not elsewhere enumerated, or those used for bait and fertilizers that could not be classified, aggregate 9,791,600 pounds. It is estimated that in 1879 39,855,000 pounds of mackerel and other fish were caught but thrown away as useless, being generally too small for sale in the fresh or pickled state, but in 1880 several million pounds of such fish were canned and found a ready sale.

The quantity and the value of fish consumed fresh is 124,101,621 pounds, valued at $1,608,523. The leading kinds thus used for food are cod, haddock, mackerel, and halibut. About 8,385,000 pounds of different species are used for bait, 25,811,573 pounds of menhaden for the manufacture of oil and guano, a few million pounds for fish-manure, and the balance eaten fresh for food.

The different species included in the total quantity of fish consumed fresh are as follows:

Kind.	Quantity.	Kind.	Quantity.	Kind.	Quantity.	Kind.	Quantity.
Alewives:	*Pounds.*		*Pounds.*		*Pounds.*		*Pounds.*
For food	937,139	Eels	395,100	Menhaden:		Squeteague	103,310
For bait	1,774,995	Flounders	571,470	For bait	254,504	Sturgeon	9,650
Bass, sea	80,550	Frost-fish	67,434	For oil and		Sword-fish	514,950
Bass, striped	287,955	Haddock	21,226,371	guano	25,811,573	Tautog	373,335
Blue-fish	4,238,234	Hake	1,378,289	Perch	33,574	Mixed fish:	
Bonito	97,000	Halibut	9,111,216	Pollock	1,100,736	For food	1,692,600
Butterfish	5,000	Herring:		Salmon	220	For bait and	
Cod	23,796,570	For food	1,216,610	Scup	1,022,180	fertilizer	8,000,000
Cunners	160,500	For bait	2,610,514	Shad	164,524		
Cusk	334,144	Mackerel	16,896,368	Smelts	35,006		

The quantity of dried fish produced from 162,562,673 pounds fresh is 62,122,008 pounds, valued at $2,412,077. About 23,000,000 pounds of the dry fish are prepared as "boneless", thus losing about 5,000,000 pounds in weight. Pickled fish to the amount of 34,006,745 pounds, valued at $928,303, are produced from 50,049,488 pounds fresh. The amount of smoked fish produced from 5,367,575 pounds fresh is 1,435,800 pounds, worth $105,997. The value of fishery products canned is $58,300; shell-fish, $649,013; products of the whale fishery, $2,089,337; and miscellaneous products, $290,200. In addition to the canned products enumerated in the table, 463,152 cans of lobsters, valued at $57,894, and 403,200 cans fresh mackerel, $33,600, were put up outside of Massachusetts in factories owned by Boston firms. These are accounted for in statistics of Maine or elsewhere. The enhancement in value of dry, pickled, and smoked fish in process of curing is estimated at $1,557,646, about 60 per cent. of which may be credited to the vessel industry and 40 per cent. to the shore industry.

The total value of fish and fish products in the marketable condition is $8,141,750. To this amount may be added 25 per cent. as the expenses and profits of the wholesale dealers of the State, thus making the total wholesale value of the products of the Massachusetts fisheries $10,117,187.

Comparing the several districts of Massachusetts, the statistics of which are given in connection with each district, we find that the district of Gloucester produces 189,383,026 pounds of fish, or more than half the entire yield of the State. The capital invested in this district is $4,326,568, and the value of sea products $3,155,071, while the total capital of the State is $14,334,450, and the total value of products $8,141,750. Boston has a large distributing business, but is not so great a producing center. The capital invested in this district is $3,218,949, and the value of the products $1,026,360. In the district of New Bedford, which is the center of the whale fishery of the United States, we find that the total capital invested is $4,329,638, and the value of products $2,053,944.

There are several industries in Massachusetts closely related to the fisheries, the statistics of which are not included in the statistics except in foot-notes. One of these is the manufacture of isinglass from fish sounds, and of liquid glue from fish skins. There are eight such factories in this State, employing one hundred and eighty-two men and a capital of $315,000. During the year 1879 the value of isinglass and glue manufactured was $450,000. Another industry largely dependent on the fisheries is that of the fertilizer factories, which employ several hundred men and a large capital. The proportion of fish entering into their productions is valued in the prepared state at $198,333. These fish are accounted for in the tables at their unprepared value.

The manufacturers of spermaceti candles, whalebone, seines, nets, hooks and lines, cables and

anchors, the builders of vessels and boats, and many other industries, depend entirely or very largely upon the fisheries for their support.

The amount of ice used in the Massachusetts fisheries during 1879 for the preservation of fish is estimated at 75,000,000 pounds, and the quantity of salt used in curing fish at about 70,000,000 pounds.

STATISTICAL SUMMATION OF THE FISHERIES OF MASSACHUSETTS.—The following statements show in detail the extent of the fisheries of Massachusetts in 1879:

Summary statement of persons employed and capital invested.

Persons employed.	Number.	Capital invested.	Amount.
Number of vessel-fishermen	a 12,637	Capital in vessels and boats	$6,681,980
Number of boat-fishermen	4,528	Capital in nets and traps	369,870
Number of curers, packers, fitters, and factory hands	2,952	Other fixed and circulating capital	b 7,282,600
Total	20,117	Total	14,334,450

a Of the vessel-fishermen, 8,289 are in the food-fish and lobster fishery; 3,991 in the whale fishery; 30 in the seal fishery; 266 in the menhaden fishery, and 30 in the oyster fishery. Some of the men engage in both the food-fish and the oyster fishery.

b Cash capital, $3,730,000; wharves, shorehouses, and fixtures, $2,875,600; factory buildings and apparatus, $677,000.

Detailed statement of capital invested in vessels, boats, nets, and traps.

Vessels and boats.	No.	Tonnage.	Value.	Value of gear and outfit, exclusive of boats and nets.	Total value.	Nets and traps.	No.	Value.
Vessels.						*Nets.*		
In food-fish and lobster fisheries	a 799	a 42,118.00	$1,968,389	$1,303,525	$3,271,914	Gill-nets:		
						In vessel fisheries	844	$10,518
In menhaden fishery	35	1,269.70	106,400	17,105	123,505	In boat fisheries	3,293	40,030
In oyster fishery	6	557.54	20,000	600	20,600	Purse-seines, in vessel fisheries	382	197,320
In whale fishery	161	36,786.51	1,065,300	1,721,850	2,787,150			
In seal fishery	1	84.65	3,000	5,000	8,000	Haul-seines, in shore fisheries	83	16,600
In squid fishery	5	264.09	8,100	2,500	10,600			
Total	1,007	81,080.49	3,171,189	3,050,580	6,221,769	Total	4,602	264,468
Boats.						*Traps.*		
In vessel fisheries	3,822		176,006		176,006	Pounds, weirs, &c	106	76,875
In shore fisheries	2,927		175,730	108,475	284,205	Lobster and eel traps	28,527	28,527
Total	6,749		351,736	108,475	460,211	Total	28,633	105,402

a Does not include 47 idle vessels, of 2,151.68 tons.

Detailed statement of the quantities and values of the products.

Products specified.	Pounds, fresh.	Pounds, prepared.	Bulk.	Value.
Grand total				$8,141,750
Fresh fish.				
For food	85,650,035			1,487,864
For bait, oil, and fertilizers	38,451,586		192,257 barrels	120,659
Total	124,101,621			1,608,523
Dry fish.				
Cod	148,327,885	56,054,757		2,176,881
Hake	7,059,460	3,181,296		65,182
Haddock	2,866,519	1,089,137		27,770
Pollock	3,653,759	1,469,293		26,778
Cusk	655,050	327,525		11,466
Total	162,562,673	62,122,008		a 2,412,077

a Includes $104,000 enhancement on fish prepared as "boneless" in Boston, but accounted for elsewhere.

Detailed statement of the quantities and values of the products—Continued.

Products specified.	Pounds, fresh.	Pounds, prepared.	Bulk.	Value.
Pickled fish.				
Alewives	972,050	777,650		$15,553
Bluefish	29,607	18,220		455
Cod	92,500	46,250		1,156
Herring	3,967,656	3,174,125		47,612
Mackerel	44,526,300	29,684,200		853,420
Swordfish	217,000	124,000		4,020
Mixed species	99,000	66,000		1,650
Halibut fins	32,875	26,300		1,052
Tongues and sounds	112,500	90,000		3,375
Total	50,049,488	34,006,745		928,303
Smoked fish.				
Alewives	266,875	160,125		4,003
Bluefish	6,000	2,000		100
Halibut	5,094,700	1,273,675		101,894
Total	5,367,575	1,435,800		105,997
Canned fish.				
Smelts			38,400 cans	4,800
Fish balls			264,000 cans	38,500
Fish chowder			36,000 cans	7,500
Clam chowder			36,000 cans	7,500
Total			374,400 cans	58,300
Shell-fish.				
Lobsters	4,315,416			158,229
Clams (includes 31,832 bushels, $12,305, for bait)			158,626 bushels	76,195
Quahaugs and sea-clams			11,050 bushels	5,525
Scallops			7,028 gallons	3,514
Oysters			36,000 bushels	41,800
Enhancement on southern oysters				363,750
Total				649,013
Products of whale fishery.				
Sperm oil			1,209,469 gallons	1,199,450
Whale, walrus, and blackfish oils			698,442 gallons	297,896
Whalebone			256,454 pounds	579,845
Ivory			19,100 pounds	5,921
Ambergris			62¼ pounds	6,225
Total				2,080,337
Miscellaneous.				
Squid			1,125 barrels	6,750
Fish oil			333,699 gallons	144,208
Fish guano			6,271 tons	32,152
Fish spawn			3,725 barrels	12,105
Fish sounds, dried		124,600	124,600 pounds	70,820
Marine salt			346 tons	3,890
Irish moss		465,000		16,275
Seaweed			4,000 tons	4,000
Total				290,200

55. HISTORY OF MASSACHUSETTS FISHERIES.

EARLY HISTORY OF THE FISHERIES.—The Massachusetts fisheries date from the settlement of the colonies in the early part of the seventeenth century. The hope of acquiring gain from the pursuit of this industry was one of the inducements for the establishment of plantations at Cape Ann and other parts of the coast. In 1624, the colonists sent a ship to England laden with fish, and the next year two others followed with cargoes of fish and furs. In 1628, they were selling

fish to the Dutch at New Amsterdam. Fish were exported from Boston as early as 1633. In 1639, for the encouragement of the fisheries, the general court passed an act which exempted fishing vessels and their apparatus from taxes and duties for some years, and relieved fishermen during the fishing season, and ship-builders from military duty. This act was the origin of the system of protection. Says Sabine (Report on American Fisheries, 1853): "Such a law, in the infancy of the colony, when contributions from every State, and the personal service in arms of every citizen, were imperatively demanded by the exigencies of the times, shows the deep importance which was attached to this branch of business by the fathers of the Commonwealth."

The following extracts from Sabine will show the condition of the fisheries of this State at various periods:

"Of the year 1641, Lechford, in his 'Plain Dealing; or, News from New England' (printed in London, in 1642), says that the people were 'setting on the manufacture of linen and cotton cloth, and the fishing trade'; that they were 'building of ships, and had a good store of barks, lighters, shallops, and other vessels'; and that 'they had builded and planted to admiration for the time. We learn from Johnson's 'Wonder Working Providence', that the Rev. Richard Blindman had gathered a church at Cape Ann, 'a place of fishing, being peopled with fishermen'; and that 'their fishing trade would be very beneficial had they men of estates to manage it.' We read in Winthrop's Journal, that 'this year the men followed fishing so well that there was about 300,000 dry fish sent to the market'; and in Hubbard, that the colonists received letters from England by the English fishing ships that came to the Piscataqua. In 1642, we find in Winthrop that the same class of ships brought news of the civil wars between the King and the Parliament, 'whereupon the churches kept divers days of humiliation'; and that 'there arrived another ship with salt, which was put off for pipe-staves,' so that 'by an unexpected providence' there was 'a supply of salt to go on with fishing'; and in Holmes, that 'the settlement at Cape Ann was established to be a plantation, and called Gloucester.' Again, Winthrop records, in 1643, the return of the Trial, 'Mr. Thomas Graves, an able and a godly man, master,' from a voyage to Bilboa and Malaga. This was the first vessel built at Boston. Her outward cargo consisted of fish, 'which she sold at a good rate'; and she brought home 'wine, fruit, oil, iron, and wool, which was a great advantage to the country, and gave encouragement to trade.'

"In 1644, we have an incident pertinent to our purpose, which is related with some particularity in the chronicles of the time. It appears that a London ship of twenty-four guns, Captain Stagg, arrived at Boston with a cargo of wine from Teneriffe; that a Bristol ship, laden with fish, lay in the harbor at the same time; that Stagg, authorized by a commission from the Cromwell party in England to capture vessels belonging to Bristol, made prize of this ship; and that a Bristol merchant and others interested in the vessel and cargo seized by Stagg collected a mob and raised a tumult. It appears further that some of the citizens of Boston, apprehensive of serious consequences, made prisoners of the merchant and other strangers and carried them before Winthrop, who confined them under guard in a public house, and that the people of the town concerned in the affair were committed to prison. Stagg was next called to an account, but it was found that he had not transcended his authority. A great excitement was produced by the occurrence, and some of the ministers, participating in the common feeling, spoke harshly of Stagg in their sermons, and exhorted the magistrates to maintain the people's liberties, which they considered had been violated by his act. A part of the magistrates were of the opinion that the Bristol ship should be restored; but the majority expressed a different view of the case, and Stagg was allowed to retain his prize. But the merchants of Boston, who, it would seem, were owners of the cargo of fish, petitioned to be allowed to test the right of the captor to *their*

property by a suit at law. Their request was granted; yet when the governor, six other magistrates, and the jury assembled they were induced to refer the decision of the whole matter to the court of admiralty. Thus terminated an affair which, at the moment, wore a very serious aspect, and threatened to involve the government of Massachusetts in a controversy with their Puritan friends in England.

"Concluding our account of the year 1644 with the remark that one ship built at Cambridge, and another built at Boston, sailed from the latter place for the Canaries with cargoes of fish and pipe-staves, we come, in 1645, to the first voyage undertaken on the distant fishing grounds of Newfoundland. The projectors of the enterprise were merchants of Boston and Charlestown, who, according to Winthrop, 'sent forth a ship and other vessels' to the Bay of Bulls. The effects of the civil war between Charles and his people, felt, as we have just seen, in the capture of the Bristol ship in Boston, were disastrous even in those remote seas; for when these vessels had nearly completed their fares the ship and most of their fish were seized by a cruiser belonging to the King's party and retained, to the great loss of the merchants.

"By an act of Massachusetts, in 1647, every householder was allowed 'free fishing and fowling' in any of the great ponds, bays, coves, and rivers, as far 'as the sea ebbs and flows,' in their respective towns, unless 'the freemen' or the general court 'had otherwise appropriated them.' By a law of the following year fishermen and others were forbidden to continue the practice of cutting fuel and timber, without license, on lands owned by individuals or towns, though during the fishing season persons who belonged to the colony might still dry their fish and use wood and timber necessary for their business on all such lands by making satisfaction to the proprietors. These laws were followed, in 1652, by another, which provided for the appointment of sworn 'fish viewers' at 'every fishing place' within the jurisdiction, who were required to reject as unmerchantable all 'sun-burnt, salt-burnt, and dry fish that hath been first pickled,' and whose fees on merchantable fish were fixed at one penny the quintal, 'to be paid one-half by the deliverer and the other half by the receiver.'

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"To supply a circulating medium, Massachusetts, as early as 1652, commenced the coinage of the 'pine-tree' shilling pieces, at which Charles the Second was much displeased. The general court, in 1677, to appease him, ordered a present of 'ten barrels of cranberries, two hogsheads of samp, and three thousand codfish.' During the same year about twenty fishing vessels were captured by the Indians on the coast of Maine. Most of them were owned in Salem, and, having from three to six men each, could have made a successful resistance had they not been taken by surprise, or, as says Hubbard, had they not been 'a dull and heavy-moulded sort of people,' without 'either skill or courage to kill anything but fish.' In fact, some vessels did make a manful defense, lost a number of men killed, and carried home nineteen others wounded. A large vessel was immediately equipped by the merchants of Salem and dispatched to recapture their vessels and punish the captors. The Indians plundered the fishing-ketches, abandoned them, and eluded their pursuers.

"In 1692 Salem lost by removals about a quarter part of its whole population, in consequence of the trials for witchcraft. The world rings with the enormities of this delusion. It should wonder, rather, that witchcraft in America was so nearly confined to the fishing county of Essex, at a period when all England was peopled with witches and goblins, and when the venerable and devout Sir Matthew Hale doomed two women to be hanged for vexing with fits the child of a herring merchant! The prosperity of Salem was checked from other causes. In 1697 John Higginson wrote his brother Nathaniel, that in 1689 he had obtained a comfortable estate, and was as much

concerned in the fishing trade as most of his neighbors; but that, in the course of the war (then soon to be terminated), he had met with considerable losses; that trade had much diminished; that of upwards of sixty fishing vessels owned in that town at the commencement of hostilities, only six remained; and that he believed no place in Massachusetts had suffered more by the war than Salem.

"At the close of the century, as we learn from Neal, the merchants of Massachusetts exported about 100,000 quintals of dried codfish annually to Portugal, Spain, and Italy, of the value of $400,000; while from another source we are informed, that, disregarding the navigation act of England, a large contraband commerce was maintained by the merchants of Boston with most of Europe.

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"In 1731 the fisheries of Massachusetts employed between five and six thousand men. Three years later a township in Maine was granted to sixty inhabitants of Marblehead, and a similar grant was made to citizens of Gloucester in 1735. Possibly many of the fishermen of these ancient towns had become weary of the hazards of the sea, and desired repose; but whatever the motives of the grantees of these lands, the perils and hardships of the forest a century ago were quite equal to those encountered upon the ocean, and such was their particular experience.

"In 1741 the cod fishery was in a prosperous condition. The annual produce was about 230,000 quintals, and the value of the quantity exported nearly $700,000. The average size of vessels was 50 tons; and of these, one hundred and sixty were owned in Marblehead alone. The whole number of fishing *vessels* in Massachusetts was not less than four hundred, besides an equal number of ketches, shallops, and undecked boats.

"In the twenty years that succeeded there was a sensible decline, for which the causes were abundant. The emigrations to Maine just mentioned, from Marblehead and Gloucester, the settlements elsewhere in the eastern country by emigrants from Cape Cod, the depopulation and almost entire abandonment of Provincetown, the expedition against Louisbourg, the general events of the two wars that occurred during this period between France and England, in the calamities of which Massachusetts was deeply involved, the demand for fishermen to man privateers and to enter the naval ships of the crown, with several minor events, combined to injure the fisheries to a very considerable degree, and at times, indeed, to render attention to them nearly impossible. After the peace of 1763, maritime enterprises were again undertaken with spirit and success, and the fishing-towns shared in the general prosperity. But the controversies that produced civil war, and finally a dismemberment of the British empire, had already commenced, and soon disturbed every branch of industry. The fisheries suffered first, and at the shedding of blood were suspended.

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"Omitting notice of the acts of Parliament which do not relate specially to the subject before us, the first law to claim our attention was passed in 1733. This act, by imposing duties on rum, molasses, and sugar imported into the colonies from any West India islands other than British, was designed to break up an extensive and valuable trade with the French, Dutch, and Spanish islands, where those products of the plantations were exchanged for fish. It is said that previous to the commencement of the trade to these islands molasses was thrown away by the planters, and that this article which is now so extensively used in food was first saved and put into casks to be brought to New England to be distilled into rum. Certain it is that on the passage of the act of 1733 the people of the northern colonies insisted that unless they could continue to sell fish to the planters of the foreign islands, and to import molasses from thence to be manufactured into spirit for domestic consumption and for trade with the Indians, they could not prosecute the

fisheries without ruinous losses. The penalty for violating the act was the forfeiture of vessel and cargo. Yet New England never submitted, though a fleet was sent to enforce obedience; and the interdicted trade with the French, Dutch, and Spanish islands did not cease until a late period of the controversy which terminated in the Revolution. In fact, therefore, a measure which threatened to ruin the cod fishery of New England produced, as I incline to believe, no serious injury to it for quite thirty years.

"But in 1764 the act was renewed, and the collection of the duties it imposed on rum, molasses, and sugar was attempted by the officers of the crown in a manner to create the most anxious concern; for the jurisdiction of the admiralty courts was enlarged, and the people were deprived of the trial by jury in all cases arising between them and the Government under this law and the trade and navigation laws generally.

"The most alarming discontents followed the collisions and quarrels which constantly occurred between ship-master and merchants on the one hand and the officers of the customs on the other in various parts of New England, and especially in Boston, Salem, Gloucester, Falmouth (now Portland, Maine), and elsewhere in Massachusetts; and the impression became general among commercial men that their business and property were both to be sacrificed to appease the clamors of the planters of the British islands, and to test the ability of the mother country to 'raise a revenue in America' under the 'sugar and molasses acts,' as this odious law was called in the politics of the day.

"Meantime the southern colonies ridiculed the madness or folly of their northern brethren in resisting taxation upon so homely a commodity as *molasses*, and made themselves merry over the accounts of the quarrels of the Yankees for cheap '*sweetening*.'

"In truth, the South, from first to last, never seemed to understand or appreciate the North upon this question, and forbore to come to the rescue for years after the leading men of Massachusetts had wasted their energies in endeavors to induce the ministry to abandon a policy so ruinous to Northern industry. The '*petty dealers in codfish and molasses*' struggled long and manfully, but without success.

"The State papers of Massachusetts contain the most earnest remonstrances against the 'sugar and molasses acts.' In the answer of the council and house of representatives to the speech of the governor, in November, 1764, it is said that 'our pickled fish *wholly*, and a *great part* of our codfish, are only fit for the West India market. The British islands cannot take off *one-third of the quantity caught; the other two-thirds must be lost* or sent to foreign plantations, where molasses is given in exchange. The duty on this article will greatly diminish the importation hither; and being the only article allowed to be given in exchange for our fish, a less quantity of the latter will of course be exported, the obvious effect of which must be a diminution of the fish trade, not only to the West Indies but to Europe, fish suitable for both these markets being the produce of the same voyage. If, therefore, one of these markets be shut the other cannot be supplied. *The loss of one is the loss of both, as the fishery must fail with the loss of either.*' These representations cover the whole ground.

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"A detailed account of the seizures of French and Spanish molasses, which, contrary to the acts of Parliament, was continually imported—or, to speak the exact truth, *smuggled*—would occupy too much space; yet, as the 'molasses excitement' was one of the earliest in the revolutionary controversy, some further notice of the course of events cannot well be omitted. The merchants, determined to maintain intercourse with the interdicted islands, devised a plan, finally,

which for a time enabled them to accomplish their purpose, and still avoid the penalties of the law. This plan was simply to lade their vessels with molasses at the French islands, as usual, but to purchase clearances, 'signed with the name, if not the handwriting, of the governor of Anguilla, who acted also as collector.' This island was so small as not to afford a cargo for a single vessel, as was well known to the collectors of the customs in New England; yet they permitted vessels furnished with the 'Anguilla clearances' to enter with their cargoes without inquiry for a considerable time; but, on a sudden, libels were filed, and prosecutions were commenced in the court of admiralty against those who had been concerned in such evasions of the statutes, and ruinous forfeitures of property and renewed clamors were the consequences.

"We pass to other topics. In 1762 the fishing towns of Massachusetts, alarmed at the news that the French had captured Saint John's, Newfoundland, petitioned the governor and council to fit out a ship and a sloop, then in the service of the province, to protect their vessels. Both vessels, in accordance with these petitions, were provided with additional men and means of defense, and sent to sea. The expense thus incurred became the subject of legislative inquiry, and was objected to because the executive branch of the Government had appropriated the public money without the consent or knowledge of the representatives of the people. The debate in the House was angry and protracted. James Otis, the popular leader, used expressions never before uttered in the colonies, and soon after the close of the session published a pamphlet, in which he justified himself for his conduct on the occasion, and defended with great ability the principles for which he had contended as a member of the House. 'This production has been considered the original source from which all subsequent arguments against taxation were derived,' while the whole affair created an intense excitement, and, in the judgment of the biographer of Otis, exerted very great influence in causing the Revolution.

"It is a singular fact that the fisheries furnished the advocates of the supremacy of Parliament with one of their best illustrations. They stated that the authority of the imperial legislature was indispensable in many cases, and that without it the colonies would often be involved in conflicts injurious to each other's interests. Governor Hutchinson, in his remarks upon the question, said, substantially, that it had been generally thought a public benefit to prevent fishing vessels from departing on their voyage until the month of April; but that if any colony engaged in the business failed to conform to a law imposing such a regulation, others that complied with it would suffer, because their fish, later caught, must of necessity be later in market; and he declares that a motion had actually been made in the legislature of Massachusetts a few years previously for parliamentary interposition in this behalf, which failed, not in consequence of any objection to the principle involved in the motion, but because a majority of the members disapproved of the restraint itself, and were willing that fishing vessels should depart from port before April, and whenever their owners and masters thought proper.

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"These incidents will serve to show the connection of the fisheries with the questions which caused a dismemberment of the British empire. It remains to speak of the act of Parliament passed in 1775, which, by depriving the people of New England of the right of fishing, was designed to 'starve them into submission.' The trade arising from the cod fishery alone at that period furnished the northern colonies with nearly half of their remittances to the mother country, in payment for articles of British manufacture, and was thus the very life-blood of their commerce. The fishing towns had become populous and rich. Marblehead, for example, next to Boston, was the most important place in Massachusetts, and was second to the capital only in population and

taxable property. A fearful change awaited all. The dispute was now to be determined by an appeal to arms, and every maritime enterprise was to be interrupted and ruined."*

Sabine gives the following figures to show the condition of the Massachusetts cod fishery before and after the Revolutionary war:

Towns.	From 1765 to 1775.			From 1786 to 1790.		
	Vessels annually employed.	Tonnage.	No. of men.	Vessels annually employed.	Tonnage.	No. of men.
Marblehead	150	7,500	1,200	90	5,400	720
Gloucester	146	5,530	888	169	3,600	680
Manchester	25	1,500	200	15	900	120
Beverly	15	750	120	19	1,235	157
Salem	30	1,500	240	20	1,300	160
Newburyport	10	400	60	10	460	80
Ipswich	50	900	190	56	860	248
Plymouth	60	2,400	420	36	1,440	252
Cohasset	6	240	42	5	200	35
Hingham	6	240	42	4	180	32
Scituate	10	400	70	2	90	16
Duxbury	4	160	28	9	360	72
Kingston	6	240	42	4	160	28
Yarmouth	30	900	180	30	900	180
Wellfleet	3	90	21	.....	.....	.....
Truro	10	400	80	.....	.....	.....
Provincetown	4	160	32	11	550	88
Chatham	30	900	240	30	900	240
Nantucket	8	320	64	5	200	40
Weymouth	2	100	16	3	150	24
In Maine (*a*)	60	1,000	230	30	300	120
Total	665	25,630	4,405	539	19,185	3,292

a Maine was at this time a district or province of Massachusetts.

THE FISHERIES FROM 1790 TO 1860.—From the close of the Revolutionary war until the war of 1812 the Massachusetts fisheries were in a somewhat fluttering condition, and efforts were made by acts of Congress to encourage them. In 1789, an act was passed which granted a bounty of 5

* "The inhabitants of the sea-shore of Massachusetts, impelled by their necessities, commenced the manufacture of salt from sea-water early in the Revolution. From the accounts preserved it would seem that they boiled the water at first, but were compelled to relinquish the experiment because of the expense and of the impurity of the salt. The next attempt was by solar evaporation, on Boston Neck, by General Palmer, 'a worthy and enterprising gentleman, who failed in consequence of the rain-water which fell into his uncovered works. The third experiment is said to have been made in Dennis, Cape Cod, by Capt. John Sears, who, in the end, was successful. He constructed a vat with rafters and shutters, so arranged as to exclude the rain in storms and to expose the sea-water to the action of the sun in pleasant weather. The first year he obtained only 8 bushels of salt. His neighbors called his invention 'Sears's Folly'; yet he persevered. The second year he made 30 bushels of salt. The fourth year, instead of pouring water into his vat from buckets, he introduced a *hand*-pump. In 1785, at the suggestion of Maj. Nathaniel Freeman, of Harwich, he contrived a *wind*-pump, which he continued to use, and which saved a vast deal of labor. In 1793, Mr. Reuben Sears, of Harwich, invented covers for salt-vats, to move on shives, or small wheels, as in ships' blocks. Five years later, Mr. Hattil Kelley, of Dennis, constructed a new kind of vat and a new method of moving the covers. Various changes were made by different persons subsequently; and the manufacture of salt from sea-water, by solar evaporation, became extensive, and at times profitable. Capt. John Sears was assisted in the improvements in his works by Captain William, Capt. Christopher Crowell, and by Capt. Edward Sears, of Dennis. They resigned to him whatever claim they might have had for their aid; and in 1799 he obtained a patent from the Government. His right was, however, disputed by others, who asserted that he made no 'new discovery.'

"In 1802 the number of salt-works in the county of Barnstable, Massachusetts, was 136, containing 121,313 feet. These works were estimated to produce annually salt of the value of $41,700. The business increased rapidly; and in 1832 the number of feet of salt-works in the same county was 1,425,000; the quantity of salt manufactured, 358,250 bushels. The reduction of the duty on the foreign article and other causes produced a great change in the value of this description of property. In 1834 the manufacture was ruinously depressed; and salt-works, which for many years previously had been considered valuable, as affording a certain income, could hardly be sold at prices above the cost of the materials used in constructing them."

cents per quintal on dried and 5 cents per barrel on pickled fish exported, in lieu of a drawback of the duties on imported salt used in the cure, and imposed a duty of 50 cents per quintal on imported fish. Bounties were doubled. In 1792 the bounty on dried and pickled fish, exported, was discontinued and a specific allowance granted to vessels employed in the cod fishery. Sabine says:

"Boats between 5 and 20 tons were entitled to receive $1 per ton annually; those between 20 and 30 tons, 50 cents additional; and to those more than 30 tons, the allowance was fixed at $2.50 per ton; but no vessel could receive more than $170 in one season. By a subsequent act the same year, those several rates were increased one-fifth, to commence in January, 1793, to continue seven years, and thence to the end of the next session of Congress.

"Still further to encourage the prosecution of the fisheries, an act of 1793 authorized the collectors of customs to grant vessels duly licensed permits 'to touch and trade at any foreign port or place,' and under such documents to procure salt and other necessary outfits without being subjected to the payment of duties. This act, which is still [1853] in force, has proved extremely beneficial to our fishing vessels in certain emergencies; but it may be admitted that its privileges are liable to be abused. Four years later, the system of allowances to vessels employed in the cod fishery was revised. Under the law then passed, the smallest class were entitled to draw from the treasury $1.60 per ton annually; and vessels of upward of 20 tons, $2.40 the ton; while the maximum was increased to $272. A second revision occurred in the year 1800, which effected some changes in details, but which provided for the continuance of the rates of allowance then fixed until March, 1811.

"President Jefferson, in his message to Congress in 1802, spoke of 'fostering our fisheries as nurseries of navigation, and for the nurture of man,' as among 'the landmarks by which we were to be guided in all our proceedings;' and made further allusion to the subject in his annual communication of the following year. His remarks, in the second message, were referred to a committee of Congress, who, in their report, said that there was too much reason to believe that both the whale and cod fisheries had been for some time on the decline, and that it was more than doubtful whether the United States employed as many men and tons in these branches of industry as when they were colonies or previous to the Revolution. As a means to reanimate them, they recommended that ships and vessels actually and exclusively employed in these fisheries should not, in future, be subject to the payment of the tonnage-duty levied on other vessels; that fishermen and other persons actually employed in catching whales and fish should be exempt from the usual charge of hospital money; and that the bounty or allowance under existing laws should be paid in cases of shipwreck or loss of vessels without deduction.

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"The embargo and other restrictive measures which preceded the war of 1812 produced the most disastrous results in New England. In 1808, and during the existence of the prohibitory acts, a number of citizens of Boston petitioned Congress for liberty to export a quantity of pickled and dried fish in their warehouses, and liable to rot or decay if kept during the summer months. But the Government declined interference, and property of this description was allowed to perish in most of the fishing towns, to the utter ruin of many of its owners. These losses were followed by others; and as the results of the policy of our own rulers, as well as the seizure and confiscation of cargoes of fish in ports of Europe under the memorable decrees of Napoleon, the distresses of all classes of persons engaged in the catching and curing the products of the sea became in the end general and alarming."

After the war of 1812, further efforts were made to encourage the fisheries. Duties were imposed on imported fish, and by the act of 1819 an allowance or bounty was granted to cod-fishing

vessels. This bounty continued in force until 1866, since which time the fishermen have had no further special national allowance than the privilege of free salt. The effects of the several acts of Congress and of the fishery treaties is discussed in another section. The bounty of 1819 allowed, under certain conditions, $3.50 per ton for the season on vessels under 30 tons, and $4 per ton on larger vessels, but no vessel could receive more than $360.

The Gloucester Telegraph, of August 15, 1829, gives the following "account of the fisheries of Massachusetts and its neighboring States from the year 1790 to 1810, said to have been made in the year 1815 by a gentleman who was well acquainted with the business, and who took considerable pains to make his statement correct, it having been made by particular request and for a special purpose."

"My calculation is, that there were employed in the Bank, Labrador, and Bay fisheries, in the years above mentioned, 1,232 vessels yearly, namely, 584 to the Banks and 648 to the Bay of Chaleur and Labrador. I think that the 584 bankers may be put down at 36,540 tons, navigated by 4,627 men and boys (each vessel carrying one boy). They take and cure 510,700 quintals of fish, and average about three fares a year, and consume annually 81,170 hogsheads of salt. The average cost of these vessels is about $2,000 each; the average price of these fish at foreign markets is $6 per quintal. These vessels also make from their fish annually 17,520 barrels of oil, which commands about $10 per barrel. Their equipments cost about $900 each, annually, exclusive of salt.

"The 648 vessels that fish at the Labrador and the Bay, I put down at 41,600 tons, navigated by 5,832 men and boys. They take and cure annually 648,000 quintals of fish. They go but one fare a year, and consume annually 97,200 hogsheads of salt. The average cost of the vessels is about $1,600, and their equipments, provisions, &c., $1,050 each. This description of vessels is not so valuable as the bankers, more particularly that class which goes from Maine, Connecticut, and Rhode Island, as they are mostly sloops and of no great value. Most of the vessels cure a part of their fish near the place where they catch them, on the beach, rocks, &c., and the rest after their return home. Several cargoes of dry fish are shipped yearly from Labrador directly for Europe. The usual markets for these fish are in the Mediterranean, say Alicante, Leghorn, Naples, Marseilles, &c., as small fish are preferred at these markets and the greater part of the fish caught in the Bay and at Labrador are very small. The average price of these fish is $5 per quintal. These vessels also make from their fish about 20,000 barrels of oil, which always meets a ready sale at a handsome price, say from $8 to $12 a barrel. Most of it is consumed in the United States.

Statistics of the Bank, Bay, and Labrador codfisheries of New England, 1790–1810.

Vessels employed in the Bank, Bay, and Labrador fisheries	1,232
Tonnage	85,140
Number of men	10,459
Number of hogsheads of salt consumed	178,370
Number of quintals of fish taken	1,158,700
Number of barrels of oil made	37,520

"There is also a description of vessels called jiggers, being small schooners of about 30 to 45 tons, which fish in the South channels, in the shoals, and near Cape Sable. They number 300 and carry about 4 or 5 hands each, say 1,200 men, and take about 75,000 quintals of fish annually and consume 1,200 hogsheads of salt and make about 4,000 barrels of oil. Their fish is generally sold for the West Indies and home consumption. There is still another description of fishing vessels commonly called 'Chebacco boats,' or 'pink-sterns.' Their number is 600, from 10 to 28 tons,

and carry 2 men and a boy each, say 1,800 hands, and consume annually 15,000 hogsheads of salt. They take and cure 120,000 quintals of fish, which are used for the home and West India markets, except the very first, which they take early in the spring, being of an excellent quality, are sent to the Bilboa market, in Spain, where they bring a great price. These vessels measure about 10,800 tons, and make 9,000 barrels of oil. There also were about 200 schooners employed in the mackerel fishery, measuring 8,000 tons, carrying 1,600 men and boys, take 50,000 barrels of mackerel annually, and consume 6,000 hogsheads of salt. The alewive, shad, salmon, and herring fisheries are immense, and consume a great quantity of salt.

Recapitulation of the cod and mackerel fisheries of New England, 1790–1810.

Vessels	2,332
Tonnage	115,940
Men	15,059
Salt, hogsheads	265,370
Fish, quintals	1,353,700
Oil, barrels	50,520
Mackerel, barrels	50,000

"There are many persons who assert that in one year there were at Labrador and up the Bay more than 1,700 vessels, besides the bankers, but I am very confident that they are much mistaken."

The extent of the fisheries of Massachusetts in 1837, as quoted from Macgregor's report by Hon. Hannibal Hamlin, of Maine, in a speech delivered in Congress August 5, 1852, was as follows:

Number of vessels employed in cod and mackerel fisheries	12,290
Tonnage of same	76,089
Number of quintals of codfish caught	510,554
Value of same	$1,569,517
Number of barrels of mackerel caught	234,059
Value of same	$1,639,049
Men employed	11,146
Total value of cod and mackerel	$3,208,866

Mr. Hamlin says:

"The number of seamen estimated there as being engaged in that year is placed at 11,146. That is the number of seamen actually engaged on the ocean. There is another class of men, very numerous, which serves to increase the number a considerable per cent., who are left upon the shore for the purpose of curing, preserving, and taking care of the fish, and who alternate with those who do the fishing; consequently the number of fishermen who are returned as actually employed in the business is not the actual number of those who devote their lives to that occupation. And the number of seamen who are engaged at different times in the fisheries cannot be accurately ascertained; but it is at least 50 per cent. above the number of those who are employed any given time in fishing."

The United States census statistics for 1840 give the following items concerning the Massachusetts fisheries, including the whale fishery:

Number of quintals of smoked and dry fish	389,715
Number of barrels of pickled fish	124,755
Number of gallons of spermaceti oil	3,630,972
Number of gallons of whale and other fish oil	3,364,725
Value of whalebone and other productions of the fisheries	$442,974
Number of men employed	16,000
Capital invested	$11,725,850

The extent of the cod and mackerel fisheries of Massachusetts for the year 1850, as reported by the census, was as follows:

Capital invested	$2,127,885
Men employed	7,917
Quintals of codfish	215,170
Barrels of mackerel	236,468
Value of products of the fisheries	$2,188,441

Hon. Lorenzo Sabine, in his report to the Boston Board of Trade for the year 1859, gives the following statistics of the fisheries of Massachusetts for that year:

Cod, mackerel, halibut, &c., fishery, tonnage	71,598
Persons employed	10,550
Value of fish and oil	$6,250,000
Capital invested	$3,700,000
Sperm and other whale fisheries, tonnage	154,048
Persons employed	11,800
Value of oil, bone, and candles	$14,500,000
Capital invested	$17,900,000

The following extract is from the Gloucester Telegraph of April 4, 1860:

"The fishing interest of this Commonwealth, owing to a variety of causes, is not an increasing one. Indeed, the tonnage employed in the cod, mackerel, halibut, &c., business is 6,349 tons less than in 1825, while the tonnage in the whale fishery is barely 13 tons more than in that year. The fisheries which produce food are rapidly concentrating at Gloucester. Thus the tonnage at that port was 19,394 in 1855, and 32,644 in 1859. So, too, a large part of the whale fishery has been transferred from Nantucket to New Bedford. The losses recently in this branch of industry have been great, and in New Bedford alone nearly $2,000,000 during the past year."

B.—THE DISTRICT OF NEWBURYPORT.

56. REVIEW OF THE FISHERIES OF NEWBURYPORT DISTRICT.

GENERAL DESCRIPTION.—Newburyport and the adjoining town of Ipswich comprise one customs district. The former place possesses a good harbor, and is important as a fishing center. Its maritime business is quite extensive. At the town of Salisbury, on the opposite bank of the Merrimac River, the dory originated about a hundred years ago. Newburyport, for many years, had a large fleet of vessels in the Labrador cod fishery, but the business is now discontinued. The fishing fleet of twenty-three sail now owned here, is engaged in the shore cod and mackerel fisheries. Large quantities of clams are annually dug from the sandy flats in the vicinity.

The Merrimac River, which empties into the ocean at Newburyport, takes its rise at an altitude of 6,000 feet among the White Mountains of New Hampshire, some 120 miles away, although the river by its course is said to be 260 miles long. It runs in a southerly direction through the center of the State of New Hampshire, and, passing into Massachusetts, for a few miles it continues south, and then turns to the northeast, which course it follows to the ocean. This stream is well known as furnishing the power for the great manufacturing interests of Nashua, in New Hampshire, and Lowell and Lawrence, in Massachusetts, as well as numerous places of less note. Twenty-five small rivers and numerous small streams are tributary to the Merrimac. The largest of these rivers are the Nashua, Contoocook, and the Winnepissoggee. The tide flows to Mitchell's

Falls, a few miles above Haverhill, and the river is navigable for small vessels to this point, 20 miles from its mouth. Within this limit are the once famous ship-building towns of Salisbury, Amesbury, and Haverhill on the north side, and Newbury, Bradford, and Newburyport on the south.

Although this part of the New England coast had been visited by explorers several years before the French explorer De Champlain, yet he is credited with the discovery of the Merrimac in 1605. The great importance and value of this stream at the present time is for the power given by its numerous falls to the great manufacturing interests along its course, yet we are reminded of the time before those industries had polluted its waters and destroyed its natural gifts. For an abundance of food-fishes of the best varieties this river then had no superior, and in the early history of the country was highly valued on their account. Even the present generation recall the time when the river was well stocked with fish. William Stark, esq., at the Manchester centennial celebration held October 22, 1851, says: "My father has seen the shad so thick as to crowd each other in their passage up the falls to gain the smooth water above, so that you could not put in your hand without touching some of them, and yet there were more alewives than shad, and more eels than both."

It is said enough eels were salted down annually to be equal in value to three hundred head of cattle. Salmon were also very abundant. Sturgeon, frequently alluded to in the early history, were plenty and caught to considerable extent. At present there is no fishing of importance carried on in the river. Alewives are taken to some extent, and during the summer New York parties camp along the banks and take sturgeon for their market. There is no record of the amount caught. Sturgeon are said to be quite plenty, but as they are not considered a food-fish in the New England markets no attention is paid to them by the New England fishermen.

The State of Massachusetts is trying to restock the river with shad and salmon, but with the numerous factories above and the non-enforcement of the protection laws below, the salmon have a hard time; yet a good progress is reported.

STATISTICAL SUMMATION OF THE FISHING INTERESTS FOR 1879.—The following statements give in detail the extent of the fishing interests of Newburyport district:

Summary statement of persons employed and capital invested.

Persons employed.	Number.	Capital invested.	Amount.
Number of vessel-fishermen	212	Capital in vessels and boats	$92,170
Number of boat-fishermen	173	Capital in nets	8,516
Number of curers, packers, fitters, &c	40	Other fixed and circulating capital	a100,000
Total	425	Total	200,686

a Cash capital, $25,000; wharves, shorehouses, and fixtures, $75,000.

Detailed statement of capital invested in vessels, boats, nets, and traps.

Vessels and boats.	No.	Tonnage.	Value.	Value of gear, exclusive of boats and nets.	Value of outfit.	Value.	Nets.	No.	Value.
Vessels.									
In food-fish fishery:							Gill-nets:		
Active	23	903.39	$43,350	$5,625	$27,175	$76,150	In vessel fisheries	13	$156
Idle	1	11.31	500	.....	.....	500	In boat fisheries	45	560
Total	24	914.70	43,850	5,625	27,175	76,650	Purse-seines:		
Boats.							In vessel fisheries	10	5,600
In vessel fisheries	104	.....	3,720	.....	.....	3,720	Haul-seines:		
In shore fisheries	113	.....	3,440	3,230	5,130	11,800	In boat fisheries	11	2,200
Total	217	.....	7,160	3,230	5,130	15,520	Total	79	8,516

Detailed statement of the quantities and values of the products.

Products specified.	Pounds, fresh.	Pounds, prepared.	Bulk.	Value, prepared.
Grand total				$140,081
Fresh fish.				
Alewives	234,399			1,314
Bass, striped	125			13
Bluefish	18,530			556
Cod	1,993,125			29,897
Cunners	500			3
Cusk	500			4
Eels	2,186			109
Flounders	1,020			15
Haddock	576,875			7,672
Hake	5,000			30
Herring	848,675			13,308
Mackerel	375,000			4,987
Menhaden	16,050			60
Perch	600			18
Pollock	2,000			8
Shad	11,124			556
Sturgeon	5,000			150
Swordfish	10,500			315
Mixed fish	142,000			710
Total	4,240,209			59,728
Dry fish.				
Cod	2,789,935	1,115,974		40,175
Cusk	12,380	6,190		167
Haddock	81,300	30,896		618
Hake	102,000	49,595		793
Pollock	90,720	37,195		632
Total	3,076,335	1,239,850		42,385
Pickled fish.				
Herring	75,000	60,000		900
Mackerel	756,300	504,200		14,496
Swordfish	3,500	2,000		65
Mixed fish	9,000	6,000		150
Total	843,800	572,200		15,611
Smoked fish.				
Halibut	40,000	10,000		800
Shell fish.				
Oysters				*a* 2,375
Clams:				
For food			27,126 bushels	13,563
For bait			12,000 bushels	4,285
Total			39,126 bushels	20,223
Miscellaneous.				
Fish oil			2,000 gallons	800
Fish spawn			50 barrels	162
Fish sounds (dried)		750		675
Seaweed			300 tons	300
Total				1,937

a Enhancement on Southern oysters.

57. THE FISHERIES OF NEWBURYPORT AND IPSWICH.

NEWBURYPORT.—Newburyport is 36 miles northeast from Boston. As the paragraphs devoted to its past history will show, this town formerly gave much attention to the fisheries; but that interest has now very much decreased in importance. Among the numerous reasons for this

decline is the inconvenient entrance to the otherwise good and safe harbor. From the first settlement of the place to the present time the ever-shifting sands have been forming great obstructions at the mouth of the Merrimac.

In former years Newburyport sent a large fleet of fishing vessels to the coast of Labrador, but during 1879 not a single United States fishing vessel visited those waters. During 1880 only one vessel went there, and she returned with 1,000 quintals of cod and 400 barrels of herring.

We record, concerning the ship-building industry of Newburyport and near towns, that in Newburyport and the neighboring towns of Salisbury, Haverhill, Rowley, Newbury, Amesbury, Bradford, and Ipswich, 1,601 vessels were built from 1781 to 1881. During the same period 671 schooners were registered as built in the customs district of Newburyport, many of which were fishing vessels. From 1875 to 1880, out of the thirty vessels built on the Merrimac, nine, with an aggregate tonnage of 267.26, were fishing schooners.

The town of Salisbury, adjoining Newburyport, is the headquarters of the dory industry. Here the dory originated, many years ago. An account of this business will be given in the chapter on fishing vessels and boats.

Clams are found in abundance on both banks of the Merrimac River from the "hump-sands," just inside its mouth on the south, to the "black rocks" on the north, a distance of one mile; here the river is from one-fourth to one-half mile wide. The clam flats are free to all with no restrictions, and the diggers say that the more they dig, the more plentiful the clams become. On an average sixty men are working the beds during the whole year. The products are largely shipped to Boston and sold to cities in the vicinity; quantities are also used by the fishermen for fresh bait; none are barreled and salted.

Sperling, or small herring, are caught in November with seines or with dip-nets by torch-light. They are taken just outside the harbor when the torch is used. The light is placed in the bow of the boat, which is slowly rowed along near the shore. The fish, being attracted by the bright light of the torch, surround the boat and follow it in such numbers that they may easily be bailed or dipped in. This operation is continued until a load is obtained. Should the oarsmen cease rowing or draw away from the shore into deep water, the fish at once disappear; they are taken only for bait, usually by the clam-diggers. One thousand barrels were caught during the fall of 1879.

In 1879 Newburyport had 23 vessels, aggregating 903.39 tons, employed in the cod and mackerel fisheries; and about 60 boats in the shore fisheries, including some 30 boats used by the clam-diggers. The capital employed in the fishing industry was $195,000, and the value of the products in first hands was about $120,000. The number of persons engaged in the fisheries was 332, and the number of shoremen was 40. The principal part of the product was sold fresh. Among other products was about 25,000 bushels of clams, some smoked halibut, dry and pickled fish, and oil.

From Salisbury Point, and other beaches in the neighborhood of Newburyport, a great quantity of sea sand is annually taken. Vessels of from 80 to 150 tons have some years taken as many as a thousand cargoes, aggregating 100,000 tons of this sand, carrying most of it to Boston.

In 1877, according to Capt. Moses Pettingell, Newburyport had twenty vessels engaged in the mackerel fishery, seven of which were fishing in the Gulf of Saint Lawrence. In summer eight vessels were engaged in fishing for mackerel with gill-nets. These vessels ranged from five to ten tons each, and carried each about thirty nets and three dories. One man manages a single dory and about ten nets. These same vessels are engaged in the winter cod fishery. Captain Pettingell estimated that the average catch to each of these vessels would be about 50,000 pounds of

mackerel in a season, valued at about $3,000. Some of them have stocked $5,000 in a season, taking fish in a seine in one night to the value of $100 to $150.

About forty open boats, nineteen-foot dories, are engaged in the winter cod fishery out of Newburyport. The fishery commences in December and continues till April. In summer the cod fishery is discontinued, the fishermen being employed in seining menhaden in the Merrimac River. In addition to these open boats there are about forty dories carried to the fishing grounds on the small schooners engaged in the gill-net fishery for mackerel. In all, about eighty dories and one hundred and sixty men are employed. A fair average return for a day's fishing was estimated by Captain Pettingell at 600 pounds of cod and similar fish.

Mr. John G. Plummer writes us the following historical sketch of the Labrador fishery from Newburyport:

"Capt. Charles Sandborn says that he went first in 1833, and there were then about eighteen or twenty large vessels. One was a ship of 360 tons. They went down to Salmon River, anchored in the river, and cruised along the shore in boats, and caught most of the cod with nets or seines. They used those seines that were knit flat and gathered at the sides, so as to have them bag some, and when they could not take all the fish in the boats they used to buoy up the lead line and leave the fish in the nets until they returned for them. Sometimes they used large bags made of nets, which they would fill with fish, and anchor them until the boats could return for them. The vessels carried fine mesh nets in which to catch capelin for bait. The voyage usually lasted about three months. The fish were dried at home, and the cost of drying (one-twelfth) was paid in shares. They were then packed in drums and shipped to the West Indies, to Bilboa, Spain, and up the Straits.

"The vessels employed were not very high cost, and were fitted at low rates. They had a codfish bounty from the Government, and so made good voyages; but after a while the Government cut off the bounty, and the cost of vessels and expense of fitting, including wages, increased so that there was no money in it. One after another the vessels were withdrawn until now (1881) not one is left. Last year there was one vessel and this year none.

"The cod that were dried here in Newburyport and packed in drums brought the best price in the West Indies of any in the world. They were not very salt and were thoroughly dry, so as to stand the heat.

"Fishermen all say that even now, with good large vessels and with a little assistance from the Government, they could compete with the French and English fishermen and make it pay; but where the French get a good bounty from Government and we get none, and the cost of fitting is higher than in France, it is impossible to make the fishery pay. These small Labrador fish have to be shipped to the same market as the English and French fish.

"Our vessels carried mostly young men and boys, and taught them to be sailors. Some of these men were in our Navy during the war, and one or two in the Kearsarge when she sank the Alabama. About twenty of them, I think, were in the Navy.

"We used to have great times here when the vessels came in from Labrador. All the men and boys we could scare up were employed in washing, hauling, drying, and packing the fish and shipping them to market. The oil was shipped mostly to Philadelphia, and the vessels usually brought back coal, corn, sugar, and molasses."

The first American vessel to engage in the Labrador cod fishery from Newburyport sailed about the year 1794, and from that time until the year 1879 there was scarcely a year when one or more vessels were not sent to that fishing ground. In 1806 this fleet numbered 45 sail; in 1817, 65 sail; in 1860, 60 sail; in 1874, 2 sail; in 1876, 2 sail; in 1879, none; in 1880, 1 sail.

IPSWICH.—The town of Ipswich is situated in Essex County, 27 miles northeast of Boston. A river of the same name, rising in the adjoining county of Middlesex, 25 miles to the southwest, flows through the town and into the bay, about 4 miles distant. The harbor, by reason of shifting sand-bars, affords an indifferent entrance to vessels. No improvement in these obstructions has been effected since the first settlement of the town.

The fishery industries of Ipswich have greatly diminished, owing to the desertion of the river by the salmon, bass, shad, and other fish. Manufacturing interests have increased, but at the same time have aided, by the emptying of unhealthy matter into the river from the factories, in the extermination of many fisheries which once were in a flourishing condition. One hundred and twenty years ago the fisheries of Ipswich had fallen 50 per cent., the number of fishing schooners being but six.

The clam industry, of especial importance in the early history of this place, has steadily decreased. The flats, out of which the clams were formerly dug in such profusion, extend from Rowley on the north to Essex on the south, including an area of 10 miles in length by half a mile in width. An attempt has been made to restore the clam flats to their former state of abundance by planting new beds, but this attempt has been fruitless. Between 1870 and 1880 there was no restriction as to the time for digging clams, but in 1880 a close season was declared by law, whereby clam digging was prohibited from May 15 to October 15. An exception to this town law was provided by a State law which allowed any fisherman to dig two bushels for bait. Permits are now required to be given to men before they are allowed to dig at all for clams. The permits are issued by the selectmen, into whose hands the town has intrusted the safe-keeping of the clam-flats. Those to whom such permits may be granted must be citizens of the place. Any offense against this town law renders the offender liable to arrest, and to a fine of $1 per bushel for all clams dug by him, and the confiscation of all tools and equipments.

Under these restrictions, seventy-five men were employed in clam digging from March 1 to June 1, 1879; and from November 1, 1879, to March, 1880, fifty men were engaged in the same business. The clams were sold for $1 per barrel in the shell, or 25 cents per gallon shelled. For fishing purposes they were sold by the water-bucketful for 50 cents, or at $4 a barrel shelled for fresh bait, and $3 a barrel for salt bait. A bushel of salt to a barrel of clams is required for "full-salted" bait, and for "slack-salted" from half a peck to half a bushel of salt. This mixture sells, according to the quantity of salt used, from $4 to $5 per barrel. In the season of 1879–'80 500 barrels were put up for bait. When this small number is contrasted with the several thousand barrels formerly prepared for the same purpose, the decrease is very apparent. It must be added, however, that a demand for clams formerly not in existence has lately sprung up; this is to supply clams as food in Boston and other neighboring cities. For this purpose, between June 15 and September 15, 1879, 40 barrels each week were shipped in the shell to Salem. Between December 1, 1879, and April 1, 1880, 60 barrels of clams in the shell and 280 gallons of shelled clams were shipped weekly to Boston and towns in the neighborhood.

The importance of the small herring, or sperling, fishery is still great, very large numbers being captured; the operation of taking them is curious and may be briefly told. Night is the time for capture. Three men go in a dory, 18 to 22 feet in length, at the bow of which a bright light is placed. This light attracts the fish round the boat, into which they are quickly bailed. A boat-load or the disappearance of the fish causes a homeward course to be taken. In 1879 fifteen boats caught about 200 barrels each, aggregating 3,000 barrels.

There is now a great interest taken in the manufacture of isinglass from fish sounds. In olden times the crude sounds were thoroughly cleaned and in that condition were sold and used as isin-

glass. In 1855 a factory for the manufacture of isinglass was built and is now actively engaged in that industry, turning out annually about 100,000 pounds of the manufactured article. The production for the year 1879 has outstripped that of any other, being 140,000 pounds. The greater portion of this quantity was made from hake sounds, chiefly supplied by American fishermen at from 75 cents to $1.15 per pound. Importations of sounds were also received from Hull and Liverpool, England; Hamburg, Germany; Bombay, India; and Maracaibo, South America; these costing 27½ cents to 80 cents per pound. A limited supply was received from Russia at $1.08 per pound. Most of this isinglass finds a market among the New York brewers and those of the Western States, at prices varying from $1.20 to $1.80 per pound.

C. THE DISTRICT OF GLOUCESTER.

58. REVIEW OF THE DISTRICT.

EXTENT OF THE FISHERIES OF GLOUCESTER DISTRICT.—The proximity of Cape Ann to the fishing grounds for cod and mackerel, and an excellent harbor for vessels of all sizes, has made this place famous in the history of the fisheries. On the north side of the cape is Ipswich Bay, which abounds with cod in the winter season, and which for more than two hundred years has been the resort of a large fleet of fishing vessels and boats. South of the cape is Boston Bay with its numerous fishing ledges and banks. Only 150 miles off the coast lies George's Bank, famous as the best of cod-fishing grounds. The principal town on the cape is Gloucester, and adjoining it are Rockport, Essex, and Manchester. These four places comprise the customs district of Gloucester.

The fisheries and vessel building have been the chief industries of the people since the first settlement of the region. At Rockport and at some of the outlying villages of Gloucester are large granite quarries which were opened many years ago by parties from Quincy. These now give employment to a considerable number of men.

The total capital invested in the fisheries in the district is $4,326,568, the value of the products in first hands $3,155,071, and the number of persons employed 6,206. These statistics are for the year 1879, which was a very disastrous and unfavorable one compared with subsequent years. The catch of the fleet in 1880 was considerably in excess of that in 1879, and prices much higher. The total weight of fish taken by the fishermen of this district in 1879 was 189,383,026 pounds as they came from the water. This quantity was reduced by dressing and curing to 106,116,499 pounds. In addition to the above amount 549,100 pounds of lobsters were taken along the shores, also 800 barrels of squid, 15,000 pounds of Irish moss, and 250 tons of seaweed. The most valuable part of the product was dry fish, of which 42,850,143 pounds were prepared, worth $1,634,103. The amount of fish sold fresh was 44,048,606 pounds, worth $727,099 to the fishermen. Pickled fish were sold to the amount of 17,967,750 pounds, worth $487,107. The smoked fish were worth $100,000; shell fish, $22,462; and miscellaneous products, $184,830.

The active fishing fleet in 1879 in this district numbered 414 sail, aggregating 23,453.72 tons, and manned by 4,505 men. Besides this active fleet there were eighteen vessels, measuring 1,136.12 tons and carrying 198 men, lost during the year on their first trip without producing any stock. There were also ten vessels measuring 431.23 tons which were idle throughout this year although employed in fishing in 1880. Included in the active fleet are several vessels which were lost during the year after making one or more fishing trips. The total losses for the year 1879, which was a very disastrous one, were twenty-nine vessels, measuring 1,893.36 tons, and 249 men.

STATISTICAL SUMMATION FOR 1879.—The following statements show in detail the extent of the fishing interests of Gloucester district:

Summary statement of persons employed and capital invested.

Persons employed.	Number.	Capital invested.	Amount.
Number of vessel-fishermen	4,505	Capital in vessels and boats	$2,060,375
Number of boat-fishermen	748	Capital in nets and traps	111,193
Number of curers, packers, fitters, &c	632	Other fixed and circulating capital	a2,155,000
Number of factory hands	321	Total	4,326,568
Total	6,206		

a Cash capital, $1,062,000; wharves, shorehouses, and fixtures, $882,000; factory building and apparatus, $211,000.

Detailed statement of capital invested in vessels, boats, nets, and traps.

Vessels and boats.	No.	Tonnage.	Value.	Value of gear, exclusive of boats and nets.	Value of outfit.	Total value.	Nets and traps.	No.	Value.
Vessels.							*Nets.*		
In food-fish fishery:							Gill-nets:		
Active	419	23,606.66	$1,148,214	$89,050	$687,900	$1,925,164	In vessel fisheries	222	$2,844
Idle	10	431.23	12,300			12,300	In boat fisheries	370	4,300
In menhaden fishery	1	46.45	500	50	300	850	Purse-seines:		
In squid fishery	4	231.84	7,100	400	1,600	9,100	In vessel fisheries	190	95,000
Total	434	24,316.18	1,168,114	89,500	689,800	1,947,414	Total	782	102,144
Boats.							*Traps.*		
In vessel fisheries	1,783		64,541			64,541	Weirs, &c	14	6,500
In shore fisheries	467		21,320	12,200	14,900	48,420	Lobster and eel pots	2,549	2,549
Total	2,250		85,861	12,200	14,900	112,961	Total	2,563	9,049

Detailed statement of the quantities and values of the products.

Products specified.	Pounds, fresh.	Pounds, prepared.	Bulk.	Value prepared.
Grand total				$3,155,071
Fresh fish.				
Alewives	40,000			225
Bass, sea	250			15
Bass, striped	570			57
Bluefish	2,500			75
Cod	6,495,070			97,426
Cunners	20,000			100
Cusk	14,040			98
Eels	1,500			75
Flounders	150,000			2,250
Haddock	10,347,300			137,619
Hake	443,160			2,659
Halibut	8,836,716			309,285
Herring	1,200,000			16,000
Mackerel	9,226,000			122,700
Pollock	415,125			1,661
Salmon	200			30
Shad	325			16
Smelts	1,000			25
Sturgeon	150			5
Swordfish	99,650			2,989
Tautog	250			9
Mixed fish	6,754,800			33,774
Total	44,048,606			727,099

Detailed statement of the quantities and values of the products—Continued.

Products specified.	Pounds, fresh.	Pounds, prepared.	Bulk.	Value prepared.
Dry fish.				
Cod	102, 313, 000	37, 856, 000		$1, 521. 727
Cusk	582, 860	291, 330		10, 488
Haddock	2, 250, 900	855, 344		23, 091
Hake	5, 986, 600	2, 694, 765		57, 398
Pollock	2, 881, 760	1, 152, 704		21, 396
Total	114, 014, 920	42, 850, 143		1, 634. 103
Pickled fish.				
Cod	31, 500	15, 750		394
Herring	2, 750, 000	2, 200, 000		33, 000
Mackerel	23, 415, 000	15, 610, 000		448, 788
Swordfish	105, 000	60, 000		1, 950
Mixed fish	18, 000	12, 000		300
Halibut fins	25, 000	20, 000		800
Tongues and sounds	62, 500	50, 000		1, 875
Total	26, 407, 000	17, 967, 750		487, 107
Smoked fish.				
Halibut	5, 000, 000	1, 250, 000		100, 000
Shell fish.				
Lobsters	285, 510			10, 468
Clams:				
For food			18, 078 bushels	9, 039
For bait			8, 281 bushels	2, 955
Total			26, 359 bushels	22, 462
Miscellaneous.				
Squid			800 barrels	4, 800
Fish oil			183, 000 gallons	84, 225
Fish guano			3, 000 tons	19, 500
Fish spawn			3, 200 barrels	10, 400
Fish sounds (dried)		116, 500		63, 000
Irish moss		15, 000		525
Seaweed			250 tons	250
Products of whale fishery—whale oil			2, 520 gallons	1, 000
Total				184, 360

STATISTICS FOR GLOUCESTER DISTRICT, 1869–1876.—The following statistics of the fisheries of this district for the years 1869 to 1876 are compiled from the annual reports of the customs collector of the district to the United States Bureau of Statistics:

Value of the products of the fisheries of the district of Gloucester for the years 1869 *to* 1876.

Years.	Codfish, cured (quintals of 112 pounds).		Mackerel, cured (barrels of 200 pounds).		Herring, cured (barrels of 200 pounds).		Other fish (quintals of 112 pounds).		Fresh fish.		Fish oil.		Shell fish.	Manure.	All other products.	Total value of all products.
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Value.	Value.	Value.	Value.
	Quin.	*Dolls.*	*Bbls.*	*Dolls.*	*Bbls.*	*Dolls.*	*Quin.*	*Dolls.*	*Lbs.*	*Dolls.*	*Galls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1869	250, 000	1, 350, 000	90, 000	1, 350, 000	40, 000	160, 000	25, 000	69, 000	8, 000, 000	240, 000	140, 000	126, 000	25, 000	15, 000	a6, 000	3, 602, 500
1870	240, 000	1, 680, 000	98, 000	1, 372, 000	12, 000	72, 000	30, 000	90, 000	7, 500, 000	375, 000	135, 000	94, 500	20, 000	15, 000	6, 000	3, 724, 500
1871	320, 000	1, 440, 000	104, 000	1, 040, 000	15, 000	52, 500	35, 000	70, 000	8, 250, 000	250, 000	180, 000	108, 000	18, 000	20, 000	8, 000	3, 006, 500
1872	384, 000	2, 016, 000	71, 075	781, 825	10, 000	45, 000	25, 000	37, 500	8, 000, 000	250, 000	225, 000	129, 000	20, 000	23, 000	b135, 000	3, 437, 325
1873	460, 000	2, 070, 000	86, 544	1, 125, 000	5, 000	23, 000	25, 000	50, 000	9, 000, 000	310, 000	275, 000	165, 000	18, 000	25, 000	15, 000	3, 801, 000
1874	475, 000	2, 375, 000	120, 000	1, 200, 000	10, 000	40, 000	30, 000	75, 000	11, 000, 000	450, 000	300, 000	171, 000	15, 000	24, 000	c75, 000	4, 425, 000
1875	451, 100	2, 508, 000	52, 783	581, 000	38, 000	153, 000	41, 000	123, 000	12, 000, 000	816, 000	300, 000	141, 000	10, 000	24, 000	d268, 000	4, 624, 000
1876	425, 000	2, 295, 000	98, 800	888, 000	30, 000	127, 500	40, 000	120, 000	11, 000, 000	745, 000	275, 000	132, 000	10, 000	25, 000	e285, 000	4, 627, 500

a Includes $2,000 worth of oysters.
b Includes 2,540,000 pounds fresh herring, $125,000.
c Includes 1,000,000 pounds salt halibut, $55,000.
d Includes 2,600,000 pounds smoked halibut, $260,000.
e Includes 2,750,000 pounds smoked halibut, $275,000.

Statement showing the number of men employed and the number and tonnage of vessels engaged in the fisheries of the district of Gloucester for the years 1869 to 1876.

Years.	Vessels employed.	Men employed.	Tonnage.
	Number.	*Number.*	*Tons.*
1869	510	6,120	24,891
1870	507	6,084	25,318
1871	491	5,900	24,904
1872	452	5,500	22,692
1873	385	5,000	21,083
1874	406	5,200	21,267
1875	397	5,100	21,537
1876	417	5,300	22,775

59. THE FISHERIES OF ESSEX AND ROCKPORT.

ESSEX.—Essex is situated 25 miles north-northeast of Boston, on the Essex Branch of the Eastern Railroad. It joins Gloucester on the east and Manchester on the south. The town was organized in 1819, when it became separate from Ipswich, which now bounds it on the north. The population of Essex in 1840 was 1,450; in 1880 about 1,800.

The place is not favorably located for fishing either from vessels or boats, as it possesses no harbor. The Essex River is a narrow stream that runs from the village to Ipswich Bay, a distance of 2 or 3 miles, and has sufficient depth of water at high tide to float the largest fishing schooners from the ship-yards to the sea.

The principal industry of the people is ship-building, upwards of 1,200 of the best fishing vessels in the New England fleet having been built here during the past fifty years. In the early history of vessel building the woodlands in the vicinity afforded most of the material needed, but at present the lumber is brought from all parts of the country. There are several saw-mills, blacksmith shops, and a spar-yard connected with the ship-yards, and a considerable number of anchor stocks and fish boxes are annually made in the town.

The only factory in the district of Gloucester for the manufacture of fishing-lines is located at Essex. The business was established in 1830, when hemp lines were used in the fisheries, but since 1845 cotton lines have taken the place of those made from hemp. The lines are tarred by steam, a process begun at Newburyport in 1875, prior to which time they were prepared in tar heated by fire. The production of the factory amounts to about $30,000 annually, all of which is sold at Gloucester for use principally in the deep-sea fisheries. The value of the buildings and machinery is about $4,000, and the number of men employed is six.

Clam-digging was formerly a profitable industry in this town, the extensive flats bordering the river affording an abundance of these bivalves. Mr. Moses Knowlton states that about 1830 upwards of two hundred men and boys were employed in digging clams, and that from 1860 to 1864 there were annually shipped from this place 3,000 barrels of shelled clams, most of which were used for bait in the cod fisheries, and sold at $13 per barrel. Since 1865 they have been used more largely for food. During the year 1879 only ten men were constantly employed in clam-digging, though at the height of the season, which lasted from October to May, there were sometimes seventy-five men and boys engaged in digging and shucking the clams. The production for the year was 11,500 bushels of clams in the shell, valued at $4,500 to the diggers. Of this quantity 9,000 bushels were shipped in the shell to Boston, Salem, and Marblehead; the remainder were shelled and sold in Gloucester, Rockport, and other places. Clams in the shell are worth

about 40 cents a bushel, while shucked they sell at $4.50 a barrel. If the shelled clams are for use as bait in the fisheries they are corned, using a peck of salt to a barrel of clams.

Some of the fishing vessels built in Essex retain their ownership here, and, although fitting and landing their catch in Gloucester, are recorded as Essex vessels. In 1879 there were two such vessels; tonnage, 156.91 tons; original cost, $11,000; present value, $9,500; number of crew, 30; gross stock for the year, $2,846. They were both engaged in the Bay of Saint Lawrence mackerel fishery, and brought home 650 barrels of mackerel.

ROCKPORT.—Rockport is on the eastern extremity of Cape Ann, 36 miles from Boston, and is the terminus of the Gloucester branch of the Eastern Railroad. It is small in area, covering only 3 miles from north to south and 1½ miles from east to west, while the coast line, because of numerous indentations, is 8 miles long. It is bounded by Gloucester on the west, and by the ocean on the east, north, and south, and is composed of two villages, situated a mile apart, and known as Sandy Bay and Pigeon Cove. These were a part of the town of Gloucester until 1840, when they were unitedly incorporated into a town under the name of Rockport. A stretch of land extending into the harbor is known as Bear's Neck. Here are located numerous small fish-houses, where hundreds of men were formerly employed in handling the catch of the many shore-boats that once sailed from here. Except for a few months in the year, Bear's Neck now appears like a deserted village. In the town are scores of veteran boat-fishermen who in earlier years found abundance of fish off this rocky shore. Most of the fishing is now carried on in large boats or vessels on more distant grounds.

Thatcher's Island, upon which are built the twin lights, often called Cape Ann lights, belongs to Rockport, and is well known to navigators. The light-houses are but a short distance apart, and are very tall, so that the lights can be seen for a long distance at sea. The town is built on a rocky headland, and from the summit the ocean view is grand. At Pigeon Cove there is a large number of handsome cottages, and the place is a favorite seaside resort.

In 1879 the fishery industries of Rockport, including vessel, boat, and lobster fisheries, and the manufacture of isinglass, were valued at $182,830, employing four hundred and sixty men and a capital of $160,100.

The shore-boat fishery in 1879 employed eighty-nine boats and one hundred and twenty-two men, and the weight of fish taken was about 2,500,000 pounds. The active fishing fleet of vessels comprised twenty-three sail, measuring 737.23 tons, valued, with their gear and outfit, at $70,450, and manned by one hundred and ninety-one men. Of this fleet, three vessels were engaged in the mackerel fishery, seven in the cod and mackerel fisheries, thirteen in the cod fishery, and one in the menhaden fishery. One of the cod vessels was engaged also in the winter haddock fishery. The production of the fleet in 1879 was 6,404 barrels mackerel, 939,600 pounds salt fish, and 1,130,000 pounds fresh fish. In the winter season a considerable share of the catch of cod by the Ipswich Bay fleet is landed at Rockport and shipped fresh to Boston. This business bids fair to add new enterprise to the fishing industry of the town.

Besides the active fleet, there were four fishing vessels idle throughout the year. These measured 113.56 tons and were valued at $3,500. They were all employed in fishing during the year 1880.

The lobster fishery gives employment to thirty men, and the number of lobsters taken in 1879 was 48,750, valued at $2,437. The number of dories in the business was nineteen, and the number of lobster pots five hundred. These pots are set along the shore and hauled daily. The bait used is generally fish heads and sculpins.

At Milk Island, and at other points off the shore, floating traps are set for the capture principally of herring and mackerel. This is a recent and not extensive fishery in this region, only one trap producing any amount in 1879, the other two that were set proving failures because of hostile opposition to this mode of fishing. The value of the traps was $1,500; number of men employed, eight; and value of the fish taken, $1,800.

The town possesses facilities for the quick distribution of fresh fish, being at the terminus of the railroad by which the fish are shipped to Boston and other places. There are five firms engaged in curing and packing fish, about two-thirds of their business consisting of salt fish that are mostly sold to Gloucester firms; the remaining third of their business is in fresh fish, principally cod and haddock. Three vessels, measuring 160.81 tons, and valued at $2,900, are employed in freighting fish and salt between Rockport, Gloucester, and other places.

Rockport has the honor of first producing isinglass from hake sounds, which is now in great demand by the brewers all over the country. A small factory was erected here and this industry started as early as 1821 or 1822, though the business was limited until about 1870, when large factories were erected and the manufacture largely increased. The first method of making the isinglass was to reduce the sounds to a pulp by grinding and then press the mass between large wooden rollers. The rollers were at first turned by hand, then horse-power was employed, and from time to time other improvements have been introduced. The rollers are now made of iron, being hollow cylinders through which cold water is allowed to pass to prevent the pulp from sticking to them, and are turned by steam. At present the sounds of codfish, weakfish, and various imported species are used in connection with hake sounds.

In 1879 there was only one factory in operation in Rockport, though there were several in other parts of the State. Another business related to this is the manufacture of glue from salt-fish skins. These two industries in 1879 represented about $50,000 capital and a product valued at $64,000. The number of persons employed was forty. In the fall of 1880 some Boston parties came to Rockport and started a new isinglass factory.

From the rocks along the shores a considerable quantity of Irish moss is annually gathered. During 1879 three men from Scituate, Mass., secured here $300 worth of that article. Seaweed is gathered by the farmers for fertilizing purposes. The cotton factory in the town was for many years busily employed in the manufacture of canvas for sails and tents.

Since the first settlement of the villages in 1695, when a grant of land was made to John Babson "to sett up fishing upon," Rockport has depended largely upon the fisheries for the support of the inhabitants. The absence of a suitable harbor for the accommodation of larger craft led the people to engage in shore or boat fishing rather than to send vessels to the offshore banks, and this branch of the fisheries has continued the favorite occupation of the people, though within thirty years the business has greatly decreased. A few Bank schooners and a considerable fleet of small craft being owned here in 1743, a wharf was built for their safety, and in 1746 another one was constructed. As they were made on the outside of logs, filled up with stones, they went to pieces in a few years. In 1810 a corporation was formed, called the Sandy Bay Pier Company, for the purpose of constructing an artificial harbor, which was accomplished at an expense of $30,000. At the North Village or Pigeon Cove a breakwater and pier were built in 1831 which cost $25,000.

According to the State census of 1865 the principal industry of the town, like that of Gloucester, was the fishing business. We find that Rockport, in that year, employed in the cod and mackerel fisheries, thirty-seven vessels, aggregating 1,386 tons, and manned by 343 men.

60. GLOUCESTER AND ITS FISHERY INDUSTRIES.

GENERAL DESCRIPTION.—Gloucester, the chief fishing port of the United States, is situated on Cape Ann, about 30 miles northeast of Boston. The harbor is one of the largest and safest on the whole coast, and is admirably adapted for carrying on an extensive maritime business. By railroad and by steam and sailing vessels, it is connected with all parts of the country, giving facilities for the rapid distribution of the products of the fisheries. Its line of sea-coast, exclusive of Rockport, with its 8 miles of shore, begins at Essex, on the north side of Cape Ann, and extends around to Manchester on the south side, a distance of 30 miles if measured from headland to headland, and if its frontage on the harbor and other indentations is included the entire coast line is over 50 miles in extent.

The business portion of the city, commonly called "the harbor," has several outlying settlements, among which is Annisquam, situated on Ipswich Bay, and having a small harbor, once the headquarters of a fleet of some fifty sail of fishing-vessels. Here are the ruins of wharves and buildings that were formerly the scene of a thriving business which is now transferred to the more capacious harbor on the other side of the cape. The Annisquam River, familiarly known as the 'Squam River, extends from Ipswich Bay to within a short distance of Gloucester Harbor, with which it is connected by a canal not much used except by pleasure boats, though large enough to admit the passage of good-sized vessels. In the river in the vicinity of Wheeler's Point and Riverdale are quite extensive clam beds, worked by some ninety men. On the opposite side of the 'Squam River is West Gloucester, known as West Parish. Some clams are dug here, and from the woods are cut many saplings, from which are made scrub-brooms and trawl buoy-staffs used in the fisheries.

Adjoining Annisquam on the north side of the cape are the villages of Bay View, Lanesville, and Folly Cove, having a bold rocky shore, with no natural harbors. These places are the homes of a hardy set of boat fishermen, who find considerable profit in the capture of lobsters and all varieties of shore fish. At both Bay View and Lanesville breakwaters have been built, making small harbors, used principally for the shelter of stone sloops, that are constantly employed in transporting granite from the extensive quarries situated here. A few small-sized fishing-vessels and numerous boats used in the shore fisheries also find shelter in these artificial basins. At Folly Cove the boats are hauled high up on the rocks on inclined platforms, where they are safe from the dashing waves. The style of boat mostly used here is a large dory, partly decked and fitted specially for sailing rather than for rowing.

The village of Magnolia, well known as a summer resort, and having a small fishery, lies to the westward of Gloucester Harbor. Off this shore is Kettle Island, where two or three floating fish-traps are set during the summer months. Returning to the harbor, we mention Norman's Woe, on the western side, at the entrance of the outer harbor. This is the spot made historic by Longfellow's poem, "The Wreck of the Hesperus." On the opposite side of the harbor is Eastern Point, a long and narrow projection, which keeps off much of the force of the winds and waves. A breakwater is greatly needed to protect the coasting and fishing fleets from storms that occasionally drive in here with great fury, and have caused the loss of numerous vessels. The inner harbor around which the wharves are built, is separated from the outer harbor by Ten Pound Island, which partly protects it from storms and makes it a good anchorage for the fleet of several hundred sail of fishing vessels.

With the exception of the granite quarries, there is no important industry carried on in Gloucester that is not dependent upon the fisheries. The prosperity of the place fluctuates according to

the scarcity or abundance of fish. There has been a steady growth in population from 7,786 in 1850, to 19,329 in 1880.(*a*) The valuation of the place, as shown by the assessors returns, was $1,635,787 in 1850, and $9,615,602 in 1877. In 1879, owing to severe losses by storms and the general depression of the fishing industry, the valuation had decreased to $8,022,623, but since 1879 an increased demand for fish, and a good catch has caused an increase to $8,977,559 valuation in 1881.

The general appearance of the city from a distance is quite inviting as it rises from the water's edge to hills of considerable size, upon which are many handsome residences. Were it not for the narrow, unpaved streets, with few sidewalks, the place would be far more attractive. There are many substantial public buildings including a fine city hall, several churches, and commodious school houses, while in the business part of the city are buildings well adapted to the fishing industry. The wharves are eighty-nine in number, seventy-four being used in the fisheries and the rest for coal and other purposes. They are well built, and have at high tide a sufficient depth of water to float large ships, a number of which annually visit the place with cargoes of salt. Close by the wharves and upon them are flake yards, where thousands of quintals of fish are daily spread to dry. Large sheds are seen on every wharf where are stowed hogsheads of fish in pickle or piles

(*a*) *Valuation and population of Gloucester from* 1845 *to* 1881.

Year.	Tax for $1,000.	Number polls.	Valuation.	Personal property.	Real estate.	Assessed	Population.
1845	$9 80	1448	$1,152,322	.....	.....	$11,273 00	
1846	10 00	1492	1,300,265	.....	.....	13,002 17	
1847	9 00	1480	1,441,215	.....	.....	15,189 60	
1848	9 00	1519	1,541,549	.....	.....	16,152 44	
1849	7 50	1591	1,605,113	.....	.....	14,412 85	
1850	11 50	2134	1,635,787	.....	.....	18,811 55	7,786
1851	12 20	2026	1,705,045	.....	.....	20,954 82	
1852	9 50	1792	2,373,488	.....	.....	24,967 26	
1853	9 50	1861	2,697,439	.....	.....	28,068 26	
1854	9 00	1803	3,272,593	.....	.....	30,927 00	
1855	10 00	1904	3,304,324	.....	.....	34,267 87	8,935
1856	9 60	1987	3,726,536	.....	.....	36,907 00	
1857	11 00	1994	3,727,214	.....	.....	42,120 00	
1858	9 00	2016	3,786,785	.....	.....	37,359 13	
1859	11 50	2157	4,051,265	.....	.....	43,457 00	
1860	9 50	2640	4,332,740	.....	.....	44,157 10	10,904
1861	9 50	2635	4,111,364	.....	.....	43,011 20	
1862	12 00	2494	4,021,033	.....	.....	53,239 33	
1863	13 00	2502	4,053,397	.....	.....	57,698 15	
1864	17 50	2459	3,936,387	.....	.....	73,887 67	
1865	22 00	2464	4,859,348	.....	.....	111,833 69	11,938
1866	15 00	2731	5,375,656	.....	.....	86,096 84	
1867	19 00	2774	6,511,754	.....	.....	129,271 32	
1868	20 00	3024	6,707,382	.....	.....	140,346 47	
1869	22 00	3030	6,993,533	.....	.....	161,170 85	
1870	20 05	3100	7,187,407	$3,110,493	$4,076,614	153,535 69	15,397
1871	20 05	3496	7,487,255	3,036,695	4,450,560	160,480 73	
1872	19 00	4117	7,899,276	2,942,834	4,956,442	158,303 67	
1873	20 00	3531	7,711,096	2,716,980	4,994,110	161,283 20	
1874	21 00	3390	8,472,329	3,031,308	5,441,021	184,699 11	
1875	19 00	3907	9,238,265	3,443,455	5,794,810	183,341 03	16,754
1876	18 00	3967	9,380,948	3,421,548	5,959,400	176,791 07	
1877	18 00	4106	9,615,602	3,452,122	6,163,480	181,292 84	
1878	18 00	4128	9,077,744	3,101,839	5,975,905	171,655 39	
1879	17 00	3678	8,022,623	2,616,238	5,406,385	142,563 63	
1880	22 00	3493	8,101,150	2,624,380	5,476,770	185,211 30	19,329
1881	18 00	3664	8,977,559	2,996,749	5,980,810	168,924 07	

of the dry fish ready for market. At the head of the wharves are the offices and stores of the outfitters. Along the water front are also many large buildings where boneless fish, mackerel, and all varieties of fish products are made ready for sale. There are in the city numerous buildings used in the manufacture and repair of boats, anchors, nets, sails, rigging, and all kinds of equipment for the fleet. Six marine railways afford facilities for hauling up and repairing the vessels. Two factories are constantly active in the preparation of copper paint, which is commonly used on the vessels' bottoms. On the outskirts of the city are buildings devoted to the manufacture of fish glue from the refuse of the boneless-fish factories. Those shore industries which cannot be strictly termed fishing industries, as boat and vessel building, sail-making, rigging, net-making, coopering, painting, and smithing, give employment to five hundred forty-one men and have an invested capital of about $400,000.

The shore industries which are directly fishing industries, as the curing and packing of fish, handling of fresh fish, manufacture of cod oil, and other fish products, employ about seven hundred men and have an invested capital of about $1,500,000.

The fishing year begins with the fitting away of the George's-men in January, when a hundred sail of stout and able craft are thoroughly equipped for a stormy season on those dangerous banks. In March the southern mackerel fleet as also the Western Bank cod fleet start on their voyages and are soon followed by the Grand Bank cod fleet. The fresh halibut vessels continue their arduous work throughout the year, only a few of them lying by for a brief period in the winter months. The fishing for mackerel in the Gulf of Maine begins in June upon the arrival home of the southern fleet, and is continued without interruption until November, when the winter haddock fishing commences and continues until the following April. In October the Grand and Western Bank cod fleet have all arrived home, and such of the vessels as are unfit for winter work are hauled up into winter quarters. In December a fleet of staunch vessels are equipped for the frozen-herring trade with Eastport and Newfoundland, those visiting the latter place being well prepared for storms on an icy coast. In this month begins also the shore fishery for cod in Ipswich Bay employing the smaller vessels of the fleet. The same vessel is often, in the course of the year, employed in several branches of the fisheries, commencing the season's work by fishing for cod, changing later to the mackerel fishery, and closing with the haddock fishery or the frozen-herring trade.

VESSEL-FITTERS AND FISHERMEN.—Most of the vessels are owned by the fitters, who run fleets of from two to twenty sail. The number of fitting firms is forty-two. These firms are owners or part owners of three hundred and seventeen schooners, which they fit out. The balance of the fleet is owned principally by the masters of the vessels, and have no regular place of fitting. Owners are expected to equip their vessels for fishing and to provision them for a cruise whether it be for a trip of a few days or six months. The common method of sharing the receipts is to subtract from the gross receipts the expense for bait, ice, and some other expenses called stock charges. The amount left is the net receipts, one-half of which belongs to the vessel owners and the other half to the crew. From the crew's half there is deducted some expenses charged to them, as for water and medicine. The balance is then divided among the men, either in equal shares or in proportion to each man's catch of fish. The captain receives an equal share with the crew and an additional percentage or commission from the vessel owners. The cook has a share with the crew and an extra amount paid by the crew, beside some perquisites. George's-men share according to the fish caught, each man cutting out the tongues of the fish as he takes them. The tongues are counted and a record kept by the captain. The best man is "high line," and the poorest or most unlucky fisherman is "low line." In the haddock fishery the fitting out and sharing is on a different basis—what is called "quarters" or "fifths." In this case the owners furnish the vessel with all her sailing

equipments and receive one-fourth or one-fifth of the receipts after the charges for wharfage and tonnage have been deducted; the crew pay for fishing-gear, dories, bait, ice, and provisions, and share equally in the balance. In the Grand Bank cod fishery and the Greenland halibut fishery part of the crew are sometimes hired by the month and have no personal share in the catch. In the frozen-herring trade the men are all hired. This cannot be called a fishery on the part of the Gloucester vessels, since the fish are all purchased.

The old method of settling with the crews in the cod-fishery vessels was to wait perhaps four or five months until the fish were cured and sold. A certain amount was charged for the expense of curing, and each man received a share in the crew's half of the net receipts. This method is still practiced at Cape Cod and at some other places in New England, but at Gloucester the voyage is at once settled, often on the same day the vessel arrives, or as soon as the fish are weighed off. Salt codfish are bought from the vessel at so much a hundredweight, usually about 60 or 75 per cent. of the value of dry cod. Mackerel are bought at so much per 200 pounds in fishermen's order, called selling "out of pickle," or they are packed and inspected and the crew paid their share after deducting from $1.50 to $2 per barrel for the expense of packing, which includes the cost of the barrel, salt, and labor.

The average annual amount realized by each fisherman is not over $300; those who are expert sometimes make double that amount, while many average less than $200 a year.

A large proportion of the Gloucester fishermen are foreigners, including many nationalities, British Provincials largely predominating, though there are many Swedes and Portuguese, and some Danes, Frenchmen, Irishmen, Scotchmen, and Englishmen. As a class they cannot be called economical, though many are prudent and save enough in a few years to buy part or the whole of a vessel. It is very gratifying to note that the number of vessels owned by the fishermen themselves is rapidly increasing, and that the deposits of money by fishermen in the savings bank is far in excess of what it was a few years ago. A good many fishermen, especially masters of vessels, own the houses in which they live. A great deal is said about the disorderly conduct of fishermen while ashore. The city marshal of Gloucester, in a recent report on the public order of the place, says:

"In this regard this city will not suffer by comparison with any other of equal size in the commonwealth. It is certainly a fact of which our citizens may well feel proud, that no city or large town in the State has a better criminal record than the city of Gloucester. In no one of them has there been so few crimes committed, and none where the class of crime has been of a lighter character. When it is considered that during much of the year numbers of our population consist of persons who have no permanent interests here, and come from all quarters of the world, it must be admitted that this is saying much; and no fact could be stated to prove more clearly the general regard of our people for public order, good morals, and law."

The vessels are insured on a mutual plan in an organization styled the Gloucester Mutual Fishing Insurance Company. At the close of each fishing year the shareholders in the company are called together to reorganize and adjust the losses of the year just past. Each vessel owner holds shares enough to cover the value of his vessel or fleet, a regular rate of premium being charged for insurance, depending somewhat on the kind of fishery in which a vessel is engaged and the season of the year. Out of the gross premiums the losses are paid, and if the premiums be not sufficient to pay these losses an assessment is made on each shareholder.

THE TRADE IN FISH.—The fishing business on shore, at Gloucester, is divided into several branches, including the trade in fresh fish, dry and pickled fish, smoked fish, boneless fish, oil and guano, sounds, and fish glue. The fisheries are divided into the shore boat-fishery and various vessel-fisheries for the capture of mackerel, haddock, and fresh halibut, the Grand Bank. Western

Banks, George's, and shore cod fisheries, the Greenland halibut fishery, and the bait-fisheries for herring, squid, and menhaden.

THE TRADE IN FRESH FISH.—Some fish have always been sold in a fresh condition, though it is only about twenty years since any great quantities have been distributed direct from Gloucester. Vessels belonging to this port generally took their catch to Boston, instead of landing it here. About 1860 a few freighters found considerable profit in buying fresh fish from the vessels, as they arrived from the Banks, and taking them to Boston. In this way time was saved to the fishermen and some profit realized by Gloucester dealers. Ice had been in use in the vessels for some fifteen years prior to that date, but very little had been done in packing fish in ice for transportation over the country until the year 1860. At that time Mr. William H Oakes and Mr. Seth Stockbridge, of Gloucester, were induced by some Boston dealers to try the experiment of shipping fresh fish from Gloucester to Boston and New York, packed with ice in old sugar-boxes. The experiment was entirely successful, and a profitable business soon developed, so that a large part of the shore catch of haddock and the catch of halibut by the George's Bank vessels were sent in this way by rail or steamer to Boston and other places.

At the present time almost the entire catch of the fresh halibut fleet, that of the boat-fisheries, and part of the catch of the haddock fleet is distributed direct from Gloucester to all parts of New England, and as far west as Chicago and Omaha. Boston remains the headquarters for the trade in fresh haddock, and most of the Gloucester vessels in that fishery go there for a market.

The fresh-fish business is carried on by several companies, who own wharves and sheds with all the conveniences for quickly packing the fish. Part of the capital of the companies is supplied by Boston and New York dealers.

The total quantity of fresh fish annually landed at this port and sent away in ice is from 13,000,000 to 16,000,000 pounds, the greater part of which is halibut. In 1879 the quantity of fresh halibut landed was 11,336,000 pounds. It was mostly brought here from the deep waters of the offshore banks by the fleet of some fifty vessels employed in that fishery. Part of the receipts of this fish is from the George's cod vessels, which usually take from a few hundred to some 4,000 or 5,000 pounds of halibut, which are iced and brought home with the salt codfish. Codfish taken by the shore boats are shipped fresh whenever the demand will warrant, though much of the catch of these boats is sold to the splitters and dried. About 2,000,000 pounds of fresh cod and haddock are annually sent in ice from Gloucester. Fresh mackerel are sent from here in considerable quantities, though most of the Gloucester vessels in the fresh-mackerel fishery take their catch direct to Boston.

There is considerable competition between the several fresh fish companies, whose agents board the vessels as they enter the harbor and make offers for the trip. A very spirited auction often occurs on the vessel's deck before the anchors are dropped. As soon as possible after a purchase has been effected, the vessel is hauled to the company's wharf and the cargo taken out by the crew, assisted by the company's men. The fish are at once weighed, cleaned, and packed in boxes holding from 300 to 450 pounds of fish, with sufficient crushed ice to insure their preservation. In the case of halibut, the heads are taken off and sold to the oil-makers, while codfish heads are generally carted back into the country to be used for guano. The boxes of fish are carted to the railway station and loaded in special cars chartered by the companies. It is nothing uncommon for a trip of 75,000 pounds of halibut to be taken from a vessel, weighed, packed, and loaded on the cars within a few hours in one forenoon, and by the next morning to be marketed in New York and Philadelphia.

The retail trade in fish is very small, there being only three fish-markets and four or five "fish-

carts" for the sale of fish, lobsters, and clams. The grocery stores keep but a small amount of cured fish on hand. A large amount of fresh and salt fish is consumed without being sold. It is a common practice among the fishermen and men who work at the packing stands to take to their homes a sample of the delicious fish for which they have toiled so faithfully; and these samples amount to a great deal in the aggregate. While on fishing trips, men who have familes to support often cure a lot of fish, which they carry to their homes on their arrival, to be used by the family during the winter. The men cure and use in this way as much as three or four hundred weight each during a year.

THE TRADE IN DRY AND PICKLED FISH.—This industry is carried on principally by the firms that own the vessels, though there are several "outside" establishments which have a large trade. At the wharves where the fish are landed are flake yards and sheds for curing and packing. Pickled fish, before they are sold outside the State, must be inspected and branded according to law. One of the firm dealing in this article is usually a deputy inspector, who is thus able to inspect and brand his own fish.

"Boneless fish" is the trade name for cured cod or other fish divested of skin and bones and cut in pieces from 3 to 8 inches in length for convenience in packing. This business was begun in Gloucester in 1869, when a limited quantity of the lower grades of cod and hake were packed in soap-boxes and peddled in Boston. The article soon met with a ready sale, and in a few years the packing of fish in this manner began rapidly to increase, so that in 1875 upwards of half a million pounds of boneless fish were prepared in Gloucester alone. From 1875 to 1879 the business made very rapid strides, nearly doubling itself in two years, so that in 1879 about 14,000,000 pounds were shipped from Gloucester to all parts of the United States. A shipment of boneless fish was made to Alaska in 1879, and this industry has since been started in that territory. There are twenty establishments in Gloucester in this business, employing 224 men and 16 women. When this method of packing fish began, men were paid $1 per hundredweight for its preparation, but competition has since reduced wages to 25 and 40 cents per hundredweight, according to quality, so that the average wages of the "skinner" is now about $1.75 per day, though expert workmen sometimes make $4.50 to $5 per day. One quintal of dried fish will make 89 pounds of boneless, thus leaving 21.9 per cent. waste in skin and bone. The method employed in the preparation of this product is described elsewhere. The fish are packed in boxes containing from 5 to 70 or 100 pounds each, and large quantities are put up in 200 or 400 pound boxes, to be repacked in smaller packages in other cities.

The manufacture of boxes for boneless fish has grown into an important industry employing a large number of persons in various parts of New England. In Gloucester there are two factories, with $10,000 capital, engaged in the business of nailing box-shooks together and in printing the ends with various brands. The average-sized box used in Gloucester for boneless fish contains 35 pounds, and upwards of 300,000 such boxes were used here in 1879.

The preparation of "desiccated fish," so called, was carried on at Gloucester for about two years prior to 1870, during which time about 500,000 pounds of salt codfish were distributed over the country under this trade name. The article was prepared by stripping the skin and bones from salt cod and then grinding the solid substance into a fibrous mass. As the product absorbed moisture it soon spoiled and proved a failure.

During the year 1880, a factory was established at Gloucester by New York parties for the manufacture of "evaporated fresh codfish." Little was done beyond experimenting as to the best methods of production. The process is a simple one and bids fair to prove a success. Fresh codfish are cleared of skin, bones, and all refuse substances and the solid flesh is subjected to heat

in large tin pans, when the substance separates into a fine fibrous mass and at the same time gives up all its moisture, so that the dry fish in a flaky state may be packed in paper boxes and shipped to all parts of the world, it being claimed by the inventor that it will keep for any length of time in any climate. Use is made of the refuse skin and bones in the manufacture of fish-glue and guano.

Mackerel are packed in barrels, half-barrels, and smaller wooden packages, also in 3 and 5-pound tin cans. As received from the vessel, the fish are not sufficiently salted, neither are they packed carefully enough to insure their preservation. They are therefore emptied from the barrels as they come from the vessel, and after being weighed, are culled into various legal grades and packed in barrels, with new salt, and the barrel filled with pickle. After being properly branded, they are ready for sale. The principal market for these fish is in the West, though large quantities are sold throughout New England.

THE TRADE IN SMOKED HALIBUT.—Gloucester is the headquarters for the manufacture and trade in smoked halibut. The usual annual production of the smoke-houses is about 2,000,000 pounds, but in 1879 only 1,250,000 pounds, valued at $100,000, were made. In 1880, the amount was still less, because of the comparatively small catch of the halibut vessels. There are two firms that own large smoke-houses and do the greater part of the business, while three other firms, with small establishments, have a limited trade. The halibut to be smoked are either received in salt flitches from the bankers and Greenland vessels, or they are bought from the fresh fish companies as landed from the fresh halibut vessels. Such fish as are not of suitable quality or freshness to send to market, are sold to the smokers and make about as good smoked fish as the best halibut. At some seasons of the year, when the demand for fresh fish is greatest, very few fresh halibut go to the smokers. Most of the smoking is done in the fall and winter.

The history of this business dates back to about 1840, when a small quantity of halibut was smoked in a house on the outskirts of Gloucester. In 1855, the quantity smoked was only 400,000 pounds, and it was not until about 1860 to 1865 that the business assumed any great proportions. At that time, some 3,000,000 pounds was the annual product. In 1876, the quantity made was 2,750,000 pounds.

There are several grades of smoked halibut, the principal kinds being known as George's, Shore, and Greenland. The last named is generally considered the best quality, and could be sold in great quantities if the fishery were more extensive. Some Gloucester smoked halibut were sent to Europe a few years ago, but no trade developed there. A small lot was exhibited at Berlin in 1880, for which the makers were awarded a medal.

THE UTILIZATION OF FISH SKINS.—Within a few years, there has been produced and invented by Gloucester parties, an article of fish-glue that bids fair to have a very extensive sale. It is made from the skins of dried cusk and codfish, the refuse of the boneless fish factories. Prior to 1876, this refuse, consisting of skins and bones, was considered worthless and was thrown away outside the harbor. The fertilizing properties found in it, and its value for making glue, has created such a demand that instead of throwing it away it was worth about $6 per ton in 1879, and is constantly advancing. Fish-glue is made from the salt skins by desalting and cooking them, when the crude glue is obtained, which is chemically treated and prepared in several qualities.

The general process for making this fish-glue is to desalt the skins by soaking in large vats of spring water. They are then steamed or cooked in tanks, when the crude glue is drained off and subjected to a patent process for evaporating the moisture. The thickened glue is then chemically treated, to prevent decomposition and to adapt it to various uses. It has found a ready sale and

is used as mucilage, as cement for broken crockery or wood work, in the manufacture of furniture, carriages, straw goods, floor oil cloths, and in many other ways.

Fish skins have been put to some other uses than the manufacture of glue or guano. The skins of cusk have been made into boots at Gloucester and the article patented, but it is doubtful whether the business will ever become profitable. Dogfish skins being rough like sand-paper or emery paper have been used by the fishermen to shine their mackerel jigs. In all parts of the world, experiments have been made with skins of different kinds of fish and they have been put to a variety of uses. Some very good looking gloves were made at Berlin in 1880, from the skins of cusk and codfish sent from Gloucester.

THE FISH-OIL INDUSTRY.—Fish oils are prepared at Gloucester from the livers of cod, hake, haddock, pollock, and dogfish, and from the heads of halibut. There are five fish-oil makers here with a capital of $105,300 and employing 50 men. The value of the product of these factories, in the census year, was $129,100.

On the cod-vessels fishing on the Grand and Western Banks, it is the common custom to have some large casks called "blubber butts" lashed upon deck just forward of the cabin. In the bilge of each cask is cut a square hole through which the livers are dropped into the cask and allowed to remain, until by the heat of the sun they are putrefied. The oil that exudes and floats upon the surface is skimmed off and stowed in barrels while the mass of refuse blubber is allowed to remain until the vessel arrives home, when it is boiled to extract the oil that may remain. George's-men and shore cod fishermen save the livers in a fresh condition and sell them direct to the oil merchants at so much a bucket or gallon. An average quantity of livers for 100,000 pounds of split fish is 450 gallons, valued at from 10 to 15 cents per gallon, according to their freshness.

A bucket of cod livers, holding about 2½ gallons, yields 1 gallon of medicinal oil, valued, when refined, at about 70 cents a gallon. In manufacturing medicinal oil, the livers are chopped up in small pieces, and then cooked by steam in tanks. The oil thus cooked out is put in 5-gallon cans and, packed in a large trough with ice and salt, is allowed to remain for about twelve hours to chill and granulate. The granulated oil is then quite thick, and is put in bags and submitted to a heavy pressure. Oil produced by this pressing is "bright," and will not congeal at 30° temperature. What is left in the bags is a sort of tallow, and is used by tanners, being sold at about 6 cents a pound. The oil weighs about 7½ pounds to a gallon, and varies in value according to the demand, ranging from 50 to 75 cents per gallon. After the oil is taken from the cooking tanks, a brownish substance remains, that is used in the manufacture of fertilizers.

The principal oil manufacturer in Gloucester annually makes from 1,000 to 1,500 barrels of medicinal or cod-liver oil, which is sent to all parts of the United States. The practice of chopping the livers has been in use but a few years, and it is claimed that more oil can thus be obtained from a quantity of livers than was formerly obtained by cooking them whole.

Tanner's oil is made from the crude oil and blubber brought home by the Grand and Western bankers, and from livers that are not fresh enough for making medicinal oil. It is worth from 40 to 50 cents per gallon.

The livers of dogfish and sharks are specially rich in quantity of oil, and these fish are sometimes taken for the sake of their livers, the bodies being cast aside as of no value. Dogfish are oftentimes very abundant in the spring of the year, when considerable quantities are taken by the shore fishermen, as well as by vessels on George's Banks, though by the fishermen who are in search of cod the dogfish are counted as annoying as thieves, stealing not only bait from their hooks, but the fish as well. George's-men are therefore not at all anxious to meet schools of dogfish, and frequently change their fishing ground at the approach of these scavengers.

Gloucester fishermen have never made a business of capturing sharks, though when large ones are accidentally taken on the lines the liver is generally saved for the oil, a large specimen of the ground or sleeper shark (*Somniosus microcephalus*) yielding many gallons of oil.

Besides cod, hake, and dogfish oil, a large amount is annually made from the heads of halibut. This business began in Gloucester about 1870, and is principally in the hands of two concerns, which consume annually about 1,000,000 pounds of halibut heads. A limited number of these heads were formerly salted for food, but the use of them for that purpose is now abandoned. Not only the heads cut from the fresh fish, but also the backbones and other refuse of halibut obtained from the smoking establishments are utilized for the production of oil. The process of manufacture is simple. The entire lot of refuse heads and bones are thrown together in a large tank and there treated with steam until thoroughly boiled. They are next placed in an open cylinder, and by means of an hydraulic press the oil is crushed out and refined for curriers' use or mixed with whale oil for various uses. The quantity of oil obtained from a ton of halibut heads is about forty gallons. From the scrap left after the oil is pressed out, a valuable use is made by manufacturers of fertilizers.

Herring, and also the heads and bones of fresh codfish, are used to a limited extent by the oil-makers. Occasional schools of black-fish are driven ashore on the north side of the cape and their heads and blubber sold to the oil factories. In 1879 about one hundred of these fish were captured at 'Squam and Coffin's beach. In the spring of 1880 several drift whales were towed into Gloucester Harbor and two of them were stripped of their blubber, which was "tried out" for the oil.

Very little menhaden oil has been made in Gloucester since 1878. Previous to that date menhaden were abundant north of Cape Cod, and a considerable quantity was brought to Gloucester to be ground up for oil and guano. The principal use made of menhaden by Gloucester fishermen has been for bait, and great quantities were once annually consumed by the mackerel and George's fleets.

When mackerel are very plenty inshore, as in the spring of 1880, there is sometimes an over-abundance of small fish, which are of no use except to be ground up for guano and oil. A factory has been built in Gloucester for canning fresh mackerel and herring, and many fish that were once thrown away or used only for guano now find a ready sale at this cannery.

FISH SOUNDS AND SPAWN.—Cod and hake sounds are used in the manufacture of ribbon-isinglass. Several firms buy these sounds of the fishermen, paying so much a pound for them pickled in barrels. The sounds are washed, cleaned, dried, and sold to the isinglass-makers. In 1879 the Gloucester fishermen saved enough of these sounds to weigh 116,500 pounds in the dry condition, and valued at $63,600. Hake sounds are worth more than twice or three times as much as the sounds of cod, the latter being mixed with the former in the production of an inferior quality of isinglass. Hake sounds have been saved for the past fifty or sixty years, though in no great quantities except during the past ten years, while cod sounds were not saved at all prior to about 1870.

The practice of saving the spawn of fish as a commercial product, was begun, by the Gloucester fishermen, about the year 1868, and has continued ever since, the demand for the article varying somewhat from year to year. The principal use of the spawn is for sardine bait, for which purpose it is exported to France, where there is an annual consumption of about 50,000 barrels, of which 40,000 barrels are Norwegian cod roe, and 10,000 barrels French and American roe. During the season commencing November, 1879, and ending April, 1880, Gloucester fishing vessels brought

home 3,200 barrels of roe, principally cod and pollock, valued at about $11,000. This was salted in barrels, and shipped to New York for exportation to France.

The quantity of spawn saved by the fishermen is limited only by the demand. Thousands of barrels of cod, haddock, halibut, pollock, and herring spawn might be brought to market if a sufficient price could be received for it. A great part of the spawn is brought to port by the George's-men in the spring of the year. It is salted in barrels on board the vessels, and upon being landed is resalted in butts or hogsheads, then taken out, drained, and packed in ordinary fish barrels. The fishermen received, during 1879, from $1.50 to $2 per barrel for spawn, without the barrel. The dealers sold it to the exporters for $3.75 to $4 per barrel, including the barrel.

THE MACKEREL FISHERY.—The mackerel fishery is perhaps the most important of any single fishery carried on at Gloucester. It employs from eighty to one hundred and fifty sail of vessels, and the annual catch is from 100,000 to 200,000 barrels. In 1879 the fleet numbered eighty-five sail that landed at Gloucester and other ports about 120,000 barrels of mackerel, including some 25,000 barrels of fresh fish sold at New York and Boston. It was formerly a hook-and-line fishery, but now the entire Gloucester fleet is fitted with purse-seines. The fishing grounds are from the capes of Virginia to the Bay of Fundy. A few years ago a large part of the fleet fished in the Bay of Saint Lawrence, but that ground has been abandoned and the fishery carried on only off the American coast. In the months of March and April the Southern fleet leave home, and, fishing off the coasts of New Jersey and Delaware, market their catch fresh in New York. As the fish move northward and eastward the fleet follow them and continue their capture as long as they can be found. In the latter part of June the Southern fleet becomes a Northern fleet, fishing in the Gulf of Maine, and is largely increased in numbers. By the last of July the fish have become much fatter and more valuable than earlier in the season. From this time until the close of the fishery in November the catch is mostly salted in barrels.

The improved methods of capture now in use enable an equal number of men to take many times more mackerel in a given period than were secured under the old methods. A single Gloucester vessel has been known to take over 1,000,000 pounds of fresh mackerel in a season. In 1880 the schooner Edward E. Webster, Capt. Solomon Jacobs, captured and landed 1,300 barrels of fresh mackerel and 2,600 barrels of pickled, which were sold for $19,745. Three or four hundred barrels of these fish are sometimes taken and salted in as many days by a single vessel. So diligently do the crews labor that when a big catch has been made they will often keep at work for forty consecutive hours without sleep.

Mackerel as they are landed in barrels from the vessels are called sea packed, and before they can be sent out of the State must be culled into grades, and inspected and branded under the laws of the State. In Gloucester a portion of the catch is sold out of pickle, or by the 200 pounds in fishermen's order. When thus sold the trip can be settled at once and the crew receive their share of the stock. The more general method of settling with the men has been to have the fish packed and inspected and charge each man a certain amount, from $1.50 to 32 per barrel, for the expense of packing, including cost of barrels, salt, and labor. Owners of vessels supply provisions, salt, gear, and barrels for the trip, but the crew are finally obliged to bear half the cost of the barrels and the salt for packing.

Mackerel have always been more or less abundant in Massachusetts Bay. Governor Winthrop saw quantities of them off Cape Ann in 1630. The colonies made regulations concerning the capture of these fish, but the industry was confined principally to towns on the south side of the bay, and little was done at Gloucester in this fishery until after this year 1800. Small fishing boats occasionally took a few fresh mackerel to Boston for a market, and some were salted, though the

entire quantity inspected in Gloucester prior to 1812 was only 1,171 barrels. An inspector was appointed for this place in 1808, but he had little to do until about 1820, when the great abundance of mackerel then in Boston Bay induced the fishermen to actively engage in their capture. Most of the vessels packed out their catch in Boston, and Gloucester had but a small share in the inspection until 1828, when 34,203 barrels were inspected here.

In 1830 this port had a tonnage of 9,643 tons employed in the fishery, and caught 51,613 barrels of mackerel entirely off the American shore.

In 1831 mackerel were so plenty off Cape Ann that the fishermen, for several days together, are said to have been employed all day in catching them and all night in splitting and salting. This was one of the most prosperous years in the history of the fishery, and the catch of the Massachusetts fleet was about 383,000 barrels. Gloucester's share of this catch, with a fleet of vessels measuring about 10,000 tons, was 69,759 barrels, all caught off the American shore. From 1831 to 1839 the mackerel business of Gloucester amounted to about 40,000 barrels annually. In 1840 the catch was only 10,241 barrels, and in each of the two following years it was less than 9,000 barrels. From 1842 to 1854 the average tonnage employed by Gloucester in this fishery was 20,000 tons, and the annual catch increased to an average of 40,000 barrels. In 1851 there were 241 vessels, measuring 13,639 tons, and manned by 2,326 men and boys.

In 1830 Gloucester mackerel vessels first began to visit the Bay of Saint Lawrence, and during the years 1854 to 1866, the period of reciprocity, a very prosperous fishery was developed in those waters. Several hundred vessels annually fitted out at Gloucester and caught large quantities of mackerel, many thousand barrels of which were shipped home in Provincial vessels, thus enabling the vessels to take two or more fares. The method of fishing was by hook and line, and enormous quantities of bait was thrown overboard to attract the fish alongside the vessel. Each vessel carried as many as 75 barrels of menhaden slivers that were chopped up for bait.

From 1854 to 1859, the first five years of reciprocity, the catch in the Bay of Saint Lawrence was not up to the average of some previous years, but the continual application of American enterprise and the use of large quantities of bait rendered the fishery more productive than it had ever been before.

The reciprocity treaty closed in 1866, and American vessels were forbidden the privilege previously granted of fishing inshore, unless they were provided with a license for which 50 cents per ton was charged. This tax was gradually increased to $2 per ton, and the consequence was that American vessels began to abandon the bay and fished in greater numbers off the coast of the United States. By the same methods used to develop the mackerel fisheries in British waters, Americans now increased the value of the fishery on our own shore, so that in 1870 the catch of the Massachusetts fleet on our coast was about 300,000 barrels, the largest since the year 1831. The share of the Gloucester fleet in this catch was 110,000 barrels. For a few years after the abolishment of the license system in the Bay of Saint Lawrence, American vessels were much annoyed in those waters, and several were seized and condemned by the British for alleged illegal fishing.

The treaty of Washington, made in 1873, gave to Americans the privilege of again engaging in the Bay of Saint Lawrence fishery without fear of cruising too near the shore. The general adoption of the purse seine by the American fleet kept more vessels on our own shore, since the seine could not be used to good advantage in the Bay. The number of vessels visiting the bay consequently decreased until in 1879 the Gloucester fleet numbered only about twenty-five sail, and in 1881 only one or two vessels went there, and their voyages were very unprofitable.

The number of arrivals of mackerel vessels at Gloucester in 1877 was 86 from the Bay of Saint

Lawrence and 692 from the American shore; in 1878, 113 from the bay and 280 from the shore; in 1879, about 30 from the bay and 250 from the shore. In 1880 the mackerel industry of Gloucester employed 175 vessels and about 2,500 men; the number of fares landed was 724, and the catch was 135,794 barrels.

The largest quantity of mackerel inspected in this port in any one year was 164,938 barrels in 1864. In each of the years from 1862 to 1867, in 1870 and 1871, and in 1880, the amount inspected here was over 100,000 barrels. The year 1879 was a very poor one, the inspection returns crediting Gloucester with only 48,643 barrels. The total quantity of mackerel taken by Gloucester fishermen in that year was about 25,000 of fresh and 95,000 barrels pickled. The fresh and a large part of the pickled fish were sold in New York, Boston, Portland, and other places most convenient to the fishing grounds.

The total quantity of mackerel inspected in Gloucester from 1808 to 1880 was about 3,500,000 barrels, or more than one-fourth of the entire number of barrels—about 12,120,000—inspected in the whole State of Massachusetts in the same period.

THE GEORGE'S COD FISHERY.—The fishery for cod on George's Bank is one of the most important as well as most dangerous of all the fisheries carried on at Gloucester. The best season for its prosecution is in the spring, when immense schools of very large and fine fish visit this bank. The George's fleet numbers about one hundred sail of staunch schooners rigged specially for this fishery. Each vessel carries a crew numbering usually ten or eleven men. They fish entirely with hand-lines from the vessel's deck, the rail being marked off in spaces, and each man is assigned a space separated from his neighbor by wooden pegs some six or eight inches high, called "soldiers," which serve as guides in hauling in the lines that are drawn out away from the vessel's side by the current, which is at times very strong. The bait used is frozen herring, as long as they can be bought; then, as the season advances, alewives, herring, menhaden, or mackerel are taken, being purchased of trap or net fishermen along the coast. Much time is lost to the fleet in searching for bait.

The vessels start out from Gloucester early in February, and make their trips of from two to three weeks' duration. They keep at this work throughout the spring and summer, meeting with less success during the warm months, and late in the fall they usually haul up for two or three months before beginning another season. Some of the fleet make as many as thirteen or fourteen trips during the year, while others follow this fishery but a short time and then join the mackerel fleet. During the summer the George's-men find better fishing in the South Channel, on Brown's Bank, off Cape Negro, or in the Bay of Fundy, than on George's.

The catch of this fleet is principally cod of superior quality that have a national reputation, and bring the highest price of any cod in the market. They are usually split and salted on the vessel, though occasional cargoes are brought home round, to be split on shore. In earlier years more fish were brought home round than at present, and it is claimed by the fishermen that the present method of splitting nearly all the catch on the fishing grounds and throwing the gurry overboard has a tendency to drive the fish away. Each man receives a share in the profits of a trip according to the number of fish he catches, the tongues being cut out of the fish as they are caught, and saved to be counted each night by the captain, who keeps the record of each man's catch. Any halibut that may be taken are marked by the fortunate catcher. A greater or less quantity of halibut is taken on each trip, ranging from a few hundred weight to four or five thousand pounds. Besides cod and halibut, which comprise most of the catch on George's, a quantity of pollock, haddock, and cusk are taken, which, when weighed off, are counted as scale-fish, and bring only about half as much as the large cod. A distinction is made between large and small

cod, those measuring not less than 27 inches from tip of nose to fork of tail being called large and others small.

Nearly all the George's cod are pickle-cured, being resalted in butts as soon as landed. After remaining in pickle until needed for sale, they are slightly dried, and are then ready to be cut up into boneless or for shipment whole.

As recorded by the Cape Ann Advertiser, the catch of George's cod by Gloucester vessels was 186,758 quintals in 1875, 26,975,000 pounds in 1876, 23,755,000 pounds in 1877, 24,158,000 pounds in 1878, and 23,144,000 pounds in 1879. The records of the United States Fish Commission give the receipts as 30,249,580 pounds in 1880. The number of arrivals in 1880 was 1,393. In the first five of the above years the catch of George's cod was more than one-half of the entire catch of cod by Gloucester vessels on all the fishing banks, but in 1880 the catch of the Western and Grand Banks fleet reached larger proportions than in previous years, and thus reduced the relative importance of the George's fishery.

The largest recorded codfish fare ever received from George's was 123,115 pounds round, with 862 pounds of halibut, by schooner S. R. Lane, Capt. Solomon Jacobs, in 1875. The vessel stocked on this trip $2,554, and the crew shared $90.81. The schooner Triton on one trip took 54,000 pounds of split and 30,000 pounds of round codfish, equal to about 111,000 pounds round, and 3,000 pounds of halibut. Several other vessels have brought home fares of over a hundred thousand pounds round. On five George's trips in a recent year the schooner Proctor Brothers took 21,544 codfish in number, weighing 171,000 pounds. Of her crew of eleven men, Mr. George Williamson was high line, taking 2,417 fish, while the low line caught 1,431.

As early as the middle of the last century Marblehead fishing vessels were accustomed to visit George's Bank for cod, making one or two trips there in the summer or early fall. They did not anchor on the fishing grounds at that date, but drifted about. It does not appear that Gloucester vessels visited that bank until 1821, when the schooners Three Sisters, Eight Brothers, and Two Friends went there, but staid on the bank only one or two days, being afraid to anchor on account of the strong current. In 1830 the schooner Nautilus anchored on the bank and secured some halibut, and may be said to have inaugurated Gloucester's share in the George's fishery.

The fishing for cod on this bank was of little importance until after the introduction of frozen herring from Newfoundland in 1856. These frozen herring arrived early in the winter and were found to be an excellent bait for the great schools of cod that visit George's at this season of the year. A very successful season was made on George's by Capt. Peter Sinclair in the winter and spring of 1859, and it was not long before large fleets of Gloucester vessels were engaged in this fishery.

The George's fishing vessels were generally from 80 to 90 tons burden, and were manned by the bravest of the Cape Ann fishermen. The fleet fitted out immediately after the arrival of frozen herring from Newfoundland, early in January, and continued throughout the spring, as long as fish could be found. About 1867 the George's fleet became still larger because of the greater abundance of frozen herring at this time brought from New Brunswick as well as from Newfoundland. Among the most successful trips at this period was that of the schooner Montana which took 100,162 pounds on a fourteen days' voyage, and in two trips the same year landed 183,362 pounds, making a gross stock of $3,417.32. Other large fares were those of 99,338 pounds, by schooner Madame Roland, in 1866; 100,575 pounds, by schooner William J. Dale, in 1868; and 102,075 pounds, by schooner Everett Steele, in 1869. One of the most valuable George's codfish trips ever made was that of schooner Madame Roland in 1865, when $2,833.29 was stocked.

THE COD FISHERY ON GRAND AND WESTERN BANKS.—The Grand and Western Banks fishery

was for many years almost abandoned by Gloucester fishermen, but about 1860 it was begun anew, and now a fleet of from fifty to seventy or eighty sail of vessels visit those banks for the capture of cod, bringing home from 12,000,000 to 20,000,000 pounds annually. The vessels that fish mostly on the Western Bank start out the earliest in the year, some of them in the month of March, and fish until about October, fishing part of the time on Banquereau and bringing home several fares. Those of the fleet that go to the Grand Bank usually make one or two Western Bank trips first and then start on a long trip to the Grand Bank. These vessels all fish with trawls and carry crews of fourteen men. The bait used is mostly fresh herring or alewives, though in the case of the Grand Bankers some squid are used. While on the Banks sea-gulls are sometimes used for bait, being called "shack bait". The men on these vessels share alike according to the catch of each dory. Two men mate in each dory and count the fish as they are thrown aboard the vessel. The fish are sold at so much a hundred-weight as they come from the vessel, and after being landed are usually washed and then either pickle-cured or kench-cured, most of them being prepared in the former way.

A few vessels are accustomed to fish on Banquereau with hand lines from dories, using salt clams for bait. The number of Gloucester vessels that fished in this way was formerly quite large; this method was abandoned a number of years ago, but in 1880 it was begun anew. Many vessels belonging to other ports catch very fair trips with salt clams, but Gloucester fishermen much prefer fresh bait.

The fishery for cod on the Grand Bank was one of the most important in the early history of New England. For many years it was not extensively carried on from Gloucester, but was engaged in principally from Marblehead and other fishing ports. Just after the Revolutionary war about sixty Gloucester vessels made Grand Bank trips, but the number of these fishing vessels at this port rapidly declined, until in 1804 there were only about ten over 30 tons burden, most of the fleet having found more profitable employment in the foreign trade. In 1819 a company with $50,000 capital was organized for the purpose of reviving this fishery, and seven schooners were fitted out, but after operating for three years the enterprise proved unsuccessful and was abandoned.

The act of Congress passed in 1819, granting bounty to vessels engaged in the cod fisheries, gave a stimulus to the fisheries, so that by 1828 the fishing fleet of Gloucester numbered 154 schooners and 68 boats.

A notable fare in the Bank fishery was that of the British schooner Keelso which arrived from the Grand Bank in October, 1880, with about 320,000 pounds codfish and 1,600 pounds of flitched halibut. In one season, from March 8 to October 15, the Gloucester schooner Josie M. Calderwood made five trips to the Western and Grand Banks, and landed 400,000 pounds of codfish and 55,000 pounds of halibut, making a stock of $10,475. In a single week in September, 1880, fifteen fares, aggregating 2,057,000 pounds of Bank codfish, were landed at Gloucester. From a fourteen weeks' trip in 1872 the schooner Ben Perley Poore landed 180,695 pounds cod and 10,597 pounds of halibut.

The quantities of codfish taken by this fleet in several years past has been as follows: in 1876, 18,627,000 pounds; in 1877, 16,865,000 pounds; in 1878, 12,202,500 pounds; in 1879, 13,247,000 pounds; in 1880, 262 fares, 16,796,000 pounds. The receipts from this fishery in 1880, including the catch of Provincial vessels landed at Gloucester, were 18,922,000 pounds.

THE FRESH HALIBUT FISHERY.—The fresh halibut fishery is almost entirely confined to Gloucester, and has been found very profitable, some vessels catching over $20,000 worth in a single year. In 1879 some sixty sail of vessels were at some time of the year engaged in this fishery, and about forty vessels pursued the business all the year; but in 1880 the number was

much smaller. The principal fishing grounds are on the edges of the offshore banks, in water from 100 to 400 fathoms deep. Occasional trips are made to the southward of the Newfoundland coast, in the vicinity of Ramea Islands, and one or two vessels have taken fares in the neighborhood of Anticosti Island, in the Gulf of Saint Lawrence, but most of the fresh halibut brought to Gloucester in recent years has come from Grand, Saint Peter's, and Quereau Banks. The vessels all market their catch in Gloucester, two or three companies making a specialty of buying these fish and shipping them, boxed in ice, to New York, Chicago, and other points.

In former years, halibut were very plenty on all the inshore and offshore banks, but were considered of little value until about 1845, when ice began to be used on the vessels. George's Banks were formerly visited by a large fleet of vessels that made a specialty of this fishery. The halibut vessels all use trawls, and for bait for the first set of the trawls they purchase herring or alewives of the net fishermen along the coast of Maine or at the Provinces. After the first set, sufficient waste fish are caught for bait. This fishery, especially in winter, is extremely dangerous, and many lives and vessels are annually lost.

The largest fare of fresh halibut ever landed by a Gloucester vessel was 140,000 pounds, by the schooner G. P. Whitman, Capt. Jerome McDonald, in 1877. Several fares of over 100,000 pounds have been landed by other vessels, among them one in 1875, of 126,566 pounds, by the schooner Chester R. Lawrence, Capt. Thomas Hodgdon. The greatest amount of money realized from a single trip was $5,361, by the schooner N. H. Phillips, Capt. William McDonald, in 1871. The quantity of fish taken was 47,650 pounds of halibut and 9,390 pounds of codfish, on a trip lasting five weeks. The usual length of a trip is from three to six weeks, though some have been made to the banks in about fourteen days.

The first trip of a Gloucester halibut vessel to George's Bank was in the year 1830, by the schooner Nautilus, Capt. J. F. Wonson. This vessel sailed from Gloucester on March 5, and returned soon after with about 20 halibut. One of the next vessels to visit the bank was the Romeo, Capt. Henry Pew, which brought home some 3,000 pounds of halibut, and sold at 3 cents a pound. In a few years the fleet was considerably increased in numbers, and George's halibut-fishing became a regular branch of industry that has been pursued with greater or less success ever since. In 1847 this fishery was of such importance that more than 3,000,000 pounds of halibut, worth over $70,000, were taken. This was about two years after they began to use ice on the vessels to preserve the fish. Some of the fleet had been fitted with wells, in which the halibut were brought home alive and peddled out one at a time.

Prior to 1848 nearly all the fresh halibut had been marketed in Boston, but in that year a company was organized in Gloucester for the purpose of diverting the trade here. The opening of railroad communication with Gloucester in 1846, afforded facilities for sending the fish to the New England markets, and it was hoped that Gloucester rather than Boston could control the trade. The enterprise proved unsuccessful, for the catch was far in excess of the demand. A stipulated price had been agreed upon between the company and the fishermen, which proved more than could be realized in the market, and after paying out some $45,000 the company was dissolved.

The George's fishery for halibut continued to be successful as a separate fishery until these fish were found more abundant on other banks. Since 1876 halibut have been brought from George's in no great amount except by the vessels fitted for cod fishing, but the aggregate amount yearly landed by these vessels has been considerable, ranging from 1,000,000 to 3,000,000 pounds per year, against 7,000,000 to 14,000,000 pounds from the other banks.

In the spring of 1876 the fleet began fishing in the deep water on the edge of George's Bank, and from that time the greater part of the catch has been from the deep water on the edge of

that and other banks. The relative quantities of fresh halibut taken by Gloucester vessels on George's in distinction from that caught on the Grand, Western, and other fishing banks, since 1875, is recorded as follows by the Cape Ann Advertiser:

Year.	George's Bank.	Other banks.	Total.
	Pounds.	*Pounds.*	*Pounds.*
1875	2, 462, 364	7, 248, 413	9, 710, 777
1876	3, 005, 100	11, 453, 000	14, 458, 100
1877	1, 814, 000	14, 319, 000	16, 133, 000
1878	524, 100	10, 914, 500	11, 438, 600
1879	995, 500	11, 717, 400	12, 712, 900
1880	1, 125, 450	7, 940, 000	9, 065, 450

In addition to the above quantities landed fresh, a large amount of salt or flitched halibut has been brought home and sold to the smoking establishments.

THE GREENLAND HALIBUT FISHERY.—Since about 1870 a few Gloucester vessels have been accustomed to visit the west coast of Greenland in pursuit of halibut which are brought home salted in flitches to be smoked. This fleet has never numbered over six or eight sail, and in 1879 there were only three vessels—the schooners Bunker Hill, Herman Babson, and Mary E. The last-named vessel fished for a few weeks on the Flemish Cap, whence she sailed for Greenland. The fishing grounds have been off the village of Holsteinberg. In 1870 the schooner Caleb Eaton, Capt. John S. McQuinn, landed 177,300 pounds of flitches taken at Greenland, and stocked $20,000.

THE WINTER HADDOCK FISHERY.—Gloucester is largely interested in the winter haddock fishery, supplying the Boston market annually with nearly 12,000,000 pounds of haddock that are sold fresh throughout New England and New York. This enormous catch of fish, which is about seven-eighths of the total quantity of haddock brought to Boston, is taken between November and April by a fleet of some fifty sail of first-class craft, averaging 60 tons burden, manned by nearly 600 men.

During a recent season the fleet was unusually successful, for although numbering only thirty-eight sail, the average stock of the vessels was $6,000, and the total catch was 14,000,000 pounds of fish. The high line of the fleet landed nearly 600,000 pounds of fish, valued at $11,232, and captured 90,000 pounds in thirteen hours' fishing, on a single trip.

Haddock vessels are of the best class, such as are employed in the mackerel and bank fisheries the balance of the year. They are equipped with dories and trawls, and provisioned for trips of from two or three days to a fortnight's duration. The catch is iced in the hold, and marketed as soon as a fair amount is secured. The fishing grounds are principally offshore, from 75 to 200 or 300 miles from port, on Cashe's, La Have, and George's Banks. Fifteen years ago, haddock were abundant inshore, so that smaller vessels could engage in the business, but now the fishery has become essentially an offshore one, requiring large and able craft to carry it on.

Fishermen share differently in this fishery from any other, going on what is called "fourths" or "fifths." The vessel, with anchors and sails, is furnished by the owners who receive one-fourth or one-fifth of the net stock after the stock charges for wharfage and towage are deducted. The remaining three-fourths of the net stock is shared equally by the crew, who provide dories, fishing-gear, bait, ice, and provisions. The captain receives a commission or percentage from the owners in addition to an equal share with the crew.

Prior to 1864 this fishery was confined chiefly to boats from the shore or to the smaller vessels. In that year, a schooner of 66 tons was fitted out for haddocking under Capt. Daniel Douglass,

which created quite a talk, and people laughed at the idea of sending so large a vessel after haddock. Notwithstanding the derision of his neighbors, Captain Douglass was very successful, securing some excellent fares which he sold at 75 cents per hundred fish. Other vessels from time to time entered this fishery, and as the demand for fresh haddock, and their value as a table fish have been constantly increasing, a greater number of large vessels have engaged in their capture until now the haddock fleet includes many of the best vessels of Gloucester.

THE MENHADEN BAIT-FISHERY.—Gloucester vessels were formerly engaged in the menhaden fishery, and sold most of their catch to cod and mackerel vessels, to be used for bait. In 1873 some forty vessels owned here procured 60,000 barrels of menhaden, that made 20,000 barrels of slivers, worth $80,000. In 1879 one vessel followed the fishery with no success, and in 1880 none attempted it. The failure of the menhaden to make their appearance on the coast of Maine and Massachusetts since 1878 has proved a serious loss to the large oil factories on the coast of Maine, as well as to the fleet of fishing vessels that formerly obtained an ample supply of bait near home, but that are now compelled to spend several days and sometimes a week or more in search of bait along the coast. During the year 1879 it is estimated that each vessel engaged in the George's cod fishery lost two months' time in searching for bait. They sometimes cruised as far south as Greenport, Long Island, and as far east as Cape Sable, before bait could be procured. The menhaden vessels were known in Gloucester as the "seining" or "baiting" fleet. They sometimes anchored in the rivers and bought the menhaden whole of the net or weir fishermen, and slivered them on the vessel, salting the slivers in barrels. The method of slivering was very simple. With the head of the fish in his left hand and a knife in his right hand, the workman cut a slice from each side of the body, leaving the head, backbone, and tail to be thrown away. When not obtained by purchase, the menhaden were taken with purse-seines, in about the same manner as mackerel.

THE SQUID BAIT-FISHERY.—The common squid (*Loligo Pealii* Les.), found along the south side of Cape Cod and in Vineyard Sound, has been used to some extent as bait by the Gloucester fishermen. In 1877 Gloucester vessels began visiting these localities, and after procuring cargoes of squid took them to Saint Pierre, Newfoundland, where they were sold for bait to the French fishermen. The first vessel to engage in this business was the schooner Pescadore, Capt. Charles Dagle, in the spring of 1877. About 120 barrels of squid were obtained from the traps along the coast, and after being salted were taken to Saint Pierre. The venture proved a profitable one, and in 1878 the same vessel made another voyage, securing about 150 barrels. In 1879 a fleet of eight Gloucester vessels embarked in this new enterprise. The season proved an unprofitable one, squid being so scarce that the entire fleet procured only about 300 barrels. The most fortunate vessels, the schooner Crest of the Wave, Capt. James Melanson, and schooner Joseph Story, Capt. Charles Dagle, obtained each 75 barrels of squid, while the remaining six vessels, schooners Cadet, Capt. James Anderson; Piscataqua, Capt. Benjamin Cook; Lizzie J. Jones, Capt. Peter Thebadau; Massena, Capt. Daniel Norwood; Bay State, Capt. Thomas Goodwin; and Carrie F. Butler, Capt. Theodore Parsons, secured only about 20 barrels apiece, and made losing voyages. Most of this fleet proceeded to Saint Pierre, where they sold their small cargoes and obtained small fares of squid by purchase at ports in Newfoundland. Several of the vessels were fitted for netting the squid in Provincial waters, but were prevented by mobs from using the seines. The schooner Bay State encountered a mob at Saint Ann's and the Cadet at Aspee Bay. Both of these vessels, as also others of the fleet, afterwards purchased squid of the natives and sold them to French fishermen, thus in a measure preventing the total failure of their voyage. In 1880 two vessels, the schooners J. J. Clark and Joseph Story, went to Vineyard Sound, secured 447 barrels of squid, took them to Saint Pierre, and made profitable trips, afterwards buying squid at Cape Breton and selling them to the French. Two or three other

Gloucester vessels proceeded direct to Cape Breton and Newfoundland, where they purchased squid and sold their trips at Saint Pierre. All these vessels were desirous of seining instead of purchasing their squid in the Provinces, but the bitter opposition of the previous year deterred them from this method of getting cargoes.

The season of squidding in Vineyard Sound is during the month of May and early in June, when the squid enter the traps and pounds with other fish, and are thus secured. The vessels purchase them of the trap fishermen and salt them, either in bulk or in barrels, in the vessel's hold. In this condition they will keep good for a number of weeks, and, although not equal to the fresh squid of Newfoundland, they are considered a good bait by the French fishermen. Occasionally Gloucester vessels have taken cargoes of squid from Cape Breton direct to the Banks and peddled them out to the Frenchmen, but the more general custom has been to sell them at Saint Pierre.

Great quantities of fresh squid are purchased at Newfoundland by American Grand Bank cod fishermen, and numerous outrages have been committed by the natives of that island upon our fishermen who have attempted to catch rather than purchase this bait. In the summer of 1880 the schooners Moro Castle and Victor of Gloucester were thus interfered with, and serious trouble avoided by the yielding of the American captains, who feared to stand for their rights in the face of so much opposition. Captain Naus, of the schooner Moro Castle, stated to the agent of the United States Fish Commission at Gloucester that his vessel had been on the Grand Bank cod fishing, and having exhausted the bait went to Newfoundland to procure a supply of squid. He anchored in Conception Bay, in Job or Devil Cove, on the afternoon of Wednesday, August 4, about a mile from the shore. That afternoon Captain Naus purchased of the natives 18,000 squid, at 60 cents per hundred, paying them $108. The next morning Captain Naus left the vessel in a dory to go in search of more bait, having learned that some could be procured at a neighboring cove. While absent he saw the mainsail of the schooner start, and knowing that something must be wrong, hurried back, and found his vessel surrounded by boats, and that some two or three hundred Newfoundlanders had boarded and taken possession of her. He ordered the intruders to leave the vessel, but they took no notice of him, and, being all alone, his crew, mostly Nova Scotians, having been frightened and taken refuge in the cabin and forecastle, he was without means of enforcing his orders. The natives were very threatening, and the captain feared for his life if he attempted unaided to regain control of the schooner. These men had come on board because some of the crew had been seen jigging for squid, although they had taken only ten or a dozen. The squid were plenty, and it would have been easy to have secured a sufficient supply for bait if the crew had been allowed their rights to free fishing without intimidation. The invaders had broken the anchor from bottom and put the schooner under mainsail and jib, and she was fast drifting towards the rocks. Seeing that there was danger of the vessel being wrecked, the invaders became frightened and hurriedly took their departure, and she was rescued from shipwreck with considerable difficulty.

Mr. Augustus Dower, one of the crew of the schooner Victor, reports that his vessel left Portugal Cove, Newfoundland, at seven o'clock on the morning of August 4, in search of bait. Having secured ice in Northern Bay, the vessel got under way and came to anchor at five o'clock in the afternoon about three-quarters of a mile from the shore in Job's Cove, Conception Bay. Squid were schooling around the vessel in large numbers, and the crew commenced fishing, all hands being busily employed in hauling them in as fast as possible. The natives, perceiving the situation, got out their boats and soon surrounded the vessel, ordering them to take in their lines and desist from fishing. Captain Bowie remonstrated, claiming the right to fish without molestation, but it availed nothing, and the rioters threatened to cut the cable and allow the vessel to go

adrift unless their demand was complied with, using the most violent and threatening language. Yielding to the force of superior numbers, fishing was abandoned, after which one of the natives who had seemed reluctant in joining the mob was brutally beaten by his companions. One of the crew of the Victor reminded the mob of the fisheries articles of the Washington treaty, and of the award of $5,500,000, but they replied that they knew nothing about treaty or money. The scene was a very exciting one, most of the hostile Newfoundlanders roaring at the top of their voices and gesticulating wildly. The mob consisted of about two hundred and fifty men in boats roughly made, averaging about 16 feet in length, a few being provided with one mast and sail, though the greater part were propelled by oars. The next morning the crew of the Victor resumed fishing, when they were again attacked, the natives brandishing their oars and striking at the captain and crew. Two of the crew were struck and slightly injured. Afterwards the mob boarded the vessel and ordered the crew to heave up the anchor. The wind being from the northwest, blowing on a lee shore, the anchor was hove up and the Victor went to Northern Bay, a distance of about 6 miles. The schooner Mattie, Captain Foster, of Beverly, was at the same place for bait, but got under way and left before an attack could be made upon her.

Job's Cove, where this assault occurred, is surrounded by high land, shaped like a quadrant, and as the wind was blowing on shore at the time, the cove affording no shelter, the vessels were in imminent danger of being wrecked if the mob carried out their threat of cutting the cables.

Capt. Charles Martin, of schooner Martha C., reports that while fishing for squid at Low Point, Conception Bay, on Monday and Tuesday, August 2 and 3, having caught a considerable quantity with jigs, a party of Newfoundlanders came on board and endeavored to prevent their fishing. Captain Martin claimed the right to fish under the treaty, and the party departed without molesting him, leaving the crew engaged in fishing. On Sunday, August 29, while engaged in catching a few squid with jigs at Ophall Cove, Trinity Bay, at daylight, a party came off in a boat and ordered them to stop, threatening to drive the vessel out of the harbor if the crew persisted in fishing. The captain told them to try it if they dared, and kept on fishing, but was not further molested.

Along the shores of Cape Ann a small quantity of squid are taken in the floating traps, but little use is made of them, the number secured not being sufficient to render them specially valuable for bait. During the spring of 1881 squid were very abundant in Vineyard Sound. The two Gloucester squid vessels that visited the region secured 350,000 that were taken to Saint Pierre, and several George's-men also procured some for bait.

THE TRADE IN FROZEN HERRING.—A large business has been done during the winter season for the past twenty-five years in the Newfoundland and New Brunswick frozen-herring trade. The Newfoundland branch of this business was inaugurated in the winter of 1854–'55 by a Gloucester fishing vessel that purchased at Newfoundland a partial cargo of frozen herring and sold them for bait to George's cod-fishermen. This new kind of bait was found to be just the thing needed by the fishermen, and a large demand was at once created for frozen herring. Its introduction among the George's-men gave new impetus to the winter cod fishery, and from that day to the present time frozen herring has been almost the only bait used at Gloucester in the winter fisheries. In 1865 a similar business was begun on the coast of New Brunswick, in the vicinity of Saint Andrews and Grand Manan. As trading at New Brunswick was attended with much less expense than in making the longer trips to Newfoundland, that region became the principal trading place of the frozen-herring fleet.

The vessels bound for Newfoundland generally leave Gloucester in November, and take out an assorted cargo suited for trade with the native fishermen from whom the herring are purchased.

In some cases the crews have taken seines for the purpose of themselves capturing the herring. Sometimes the natives have been hired to take the fish with the American seines rather than with their own rude gear. About the middle of January these vessels arrive at Gloucester, and sell the herring for bait, or else proceed to New York or Boston, where there is a demand for these fish as food.

The New Brunswick trade now has its headquarters at Eastport, Me., near the herring grounds. Instead of taking out general cargoes for trade, vessels in this business go from Gloucester to Eastport in ballast or empty, and purchase the herring from the catchers either directly or through an agent who is sent out from Gloucester for this purpose. The business can be carried on only during cold weather, and must be abandoned in March or the early part of April. The cargoes are stowed in bulk in the vessel's hold, and sometimes the cabin is also filled full, large vessels bringing home from 300,000 to 500,000 herring at a time. The crews on the vessels are small, numbering from three to seven men, or just enough to navigate the vessel and care for the cargo. All the men are hired by the month, and have no special share in the venture. In the chapter on the fisheries the frozen-herring business is fully discussed in all its phases, and need not be further mentioned here. It was in this trade at Newfoundland that the Fortune Bay outrages occurred a few winters ago. The business gives employment to from thirty to fifty sail of vessels that might otherwise be unemployed during the winter, and has proved very profitable to those engaged in it. As it is a trade rather than a fishery, the statistics of product and capital are not included in the census report.

During the year 1880 there arrived at Gloucester 19,587,000 frozen herring, valued at about $100,000. Nearly all of these came from the vicinity of Grand Manan, New Brunswick, and Eastport, Me. Of this great number of herring, 11,742,000 were sold at Gloucester to the fishing vessels for bait, and the balance, 7,845,000, were sent to New York, Boston, and Philadelphia to be sold for food.

THE SHORE BOAT FISHERIES.—The shore fishery includes the capture of cod, hake, haddock, mackerel, and herring. The boats are all under five tons burden, most of them simply dories, carrying two or three men each. The number of shore boats in 1879 was 256, the number of men 356, and the catch, 5,076,000 pounds of fish. Abou 125 of these men are engaged in this shore fishery the year round, while the remainder fish only during the winter season, when great schools of cod usually visit the shores of Cape Ann.

From November until May the principal catch of the boats is codfish. During May and until July haddock become more abundant, and from July till the middle of September hake are chiefly taken. By the latter part of September all the shore fishermen are active in preparation for the expected school of herring that come in to spawn. For about a week at the beginning of October there is great bustle in the capture of these herring, but after they have left the coast there is little for the small boats to do but to wait for the coming of the winter cod. The larger boats during this interval go offshore a few miles for pollock that are usually abundant in the latter part of October and first of November. Boats that have good gill-nets, especially those on the north side of the cape, find considerable profit during the summer months in taking mackerel in Ipswich Bay. At Lanesville and Folly Cove haking is a favorite pursuit of the fishermen. In favorable seasons they take from 3,000 to 4,000 quintals of these fish, and make, besides a profit from the fish themselves, an equal profit on the sounds and livers. Hake frequently sell for 60 cents per hundred-weight as they come from the water, while the sounds and livers are alone worth that amount, so that fishermen who have the facilities cure their own fish and make nearly

double wages, as they sell the dried hake for about $1.50 per quintal, and the dried sounds for 60 to 75 cents per pound, the livers being tried out for their oil.

In seasons of the year when alewives, mackerel, or herring are along the shore, the boats supply themselves with bait from their nets, each boat having usually four nets set in the harbors. They visit these about daylight and then start out on their day's fishing, to return in the afternoon in season to market their fish in Gloucester, or to send them to Boston for the next morning's trade. In the winter months the chief bait of the boats is sperling or small herring taken in the rivers, and frozen herring from Grand Manan and Eastport. The grounds visited by the boats are mostly within a short distance of land, and have received various peculiar names, such as Old Man's Pasture, Honey Pink, Saturday Night, and Eleven Fathom Ground. Both hand-lines and trawls are used; most of the dory fishermen prefer the former, although during the haking season all use trawls.

The shore fisheries from Gloucester were of considerable importance about 1832, when 799 men were employed in it. The catch, 63,112 quintals of cod, was valued at $157,780, and a Government bounty of $25,172 was received. In 1804, when the bank fisheries were almost abandoned, the shore fisheries employed two hundred sail. Most of this boat-fishing was carried on at Sandy Bay or Rockport, which was then a part of Gloucester, and that place has continued until the present day to be more or less engaged in these fisheries.

The boats in use at the beginning of the century were mostly the Chebacco boats of some 15 tons burden, and carrying four or five men. They had two masts, but no bowsprit. A small cuddy forward afforded sleeping room for the men on their trips, lasting usually four or five days. These boat-fishermen seldom ventured more than 20 or 30 miles from shore. Dory-fishing began about 1825, and is still carried on off Cape Ann more or less throughout the year. In early years fish were very abundant in the harbor and all about Gloucester, so that in the haddock season in the spring there was no difficulty in securing a boat-load in a short time. Since 1866 haddock have been more abundant offshore, and their capture has been by large vessels.

Codfish, hake, and pollock have been the principal catch of the shore-boats, and some good day's work have been made. Two men at Folly Cove took 3,900 pounds of codfish in one day in the winter of 1877–'78. The method of fishing since 1855 has been mostly by trawls, though hand-lines are used at some seasons of the year.

THE BOAT-FISHERY FOR HERRING.—There is no extensive fishery with gill-nets in the vicinity of Gloucester except for a few weeks in the fall of the year, when the herring visit these shores to spawn. Many of the shore-boats are supplied with nets for the capture of bait, setting them in various parts of the outer harbor, and taking each day enough alewives or herring for the day's fishing. Occasionally schools of mackerel visit the harbor, when the bait-nets capture a considerable number. On the north side of the cape the shore-boats take more mackerel in this way than the harbor-boats, but in neither case is it an important fishery. The nets in use are about four hundred in number, and are generally 20 fathoms long by 3 fathoms deep, with $1\frac{3}{4}$ to $2\frac{3}{4}$ inch mesh, the average mesh being $2\frac{1}{4}$ inches.

During the latter part of September and the early part of October herring are usually very plenty along the shores of Cape Ann, and about 10,000 barrels are annually captured by a fleet of about one hundred and fifty boats and vessels equipped with gill-nets.

In the season of 1879 the herring made their appearance on the 20th of September. Through the succeeding week few were taken, but on Sunday, the 28th, they were very abundant, and considerable numbers were captured in the nets. During Wednesday and Thursday of this week the fishermen were busy enough. The weather was mild, water smooth, and everything favorable for a

good catch. All the available boats in Gloucester Harbor were made use of to gather in the harvest that lay at the fishermen's door. Nets were set at night and in the early morning they were found loaded down with fish, being, in many cases, sunk by the weight of the fish, and many nets were lost in this way. Fishermen who were not provided with nets visited the spot and from the fragments got good boat loads. The nets used were the ordinary gill-nets of 2½ and 2¾ inch mesh, 25 fathoms long, anchored at each end. They were sunk about 2 fathoms below the surface of the water. The principal fishing ground was in the vicinity of Norman's Woe, on the western side of the harbor, and extending nearly a mile off from the rocky shore. The nets were set for about three-quarters of a mile in a southeast direction from the shore, and then in a northeast and southwest direction for a half mile. Within this small compass upwards of 20 miles of gill-nets were set during the two principal days of the fishery. On Friday, October 3d, the school of herring had disappeared from Norman's Woe, having moved westward toward Marblehead, where considerable numbers were taken, and within a few days they had left the coast. There were landed in Gloucester during that season, about 10,000 barrels of herring, for which the fishermen were paid from 75 cents to $1.50 per barrel, or an average of $1 a barrel.

THE SHORE VESSEL FISHERIES.—During the winter of 1878–'79 the United States Fish Commission made some successful experiments off Gloucester Harbor with gill-nets for the capture of cod. The nets were from 8 to 10 inch mesh and were found eminently adapted for the winter shore cod fishery. The fishermen were at first not disposed to provide themselves with these nets, but they were afterwards generally used by the Gloucester fleet fishing in Ipswich Bay, and very successful seasons have resulted.

A shore fishery for cod is quite extensively carried on during the winter months in Ipswich Bay, in vessels of from 20 to 40 tons burthen. During some winters large schools of very fine cod visit this bay, especially on the northern side toward Newburyport and Portsmouth, and a large part of the catch is marketed at those ports. The vessels are fitted either with trawls or gill-nets. The principal trawl bait used is frozen herring. Most of the catch is sold fresh, though when more can be realized by drying the fish they are sold to the splitters. A fleet of some sixty sail of Gloucester vessels was engaged in this fishery in the winter of 1879–'80.

After the close of the winter fishing some of these vessels cruise further to the eastward, fishing on Cashe's Banks, off Matinicus, and other eastern grounds, capturing all varieties of ground fish. A part of the fleet fish on Middle Bank for haddock, or cruise off the south of Cape Cod, and off Block Island. In the summer season those vessels that are large enough engage in seining mackerel, while the rest cruise on the haking grounds off the eastern coast. In the early fall pollock become abundant in Boston Bay off Gloucester, and are taken in large quantities.

THE FISHERY WITH FLOATING TRAPS.—Until the year 1874 no attempt had been made in the vicinity of Gloucester to capture fish by the use of traps, pounds, or weirs. In that year Mr. Henry Webb, of Rockport, set a floating trap at Milk Island, on the outside of Cape Ann. The venture proved profitable, so that each year since a trap has been set at that island. This continued to be the only trap in the vicinity until 1879, when four more were set at various points, and a crude stake-weir was built in Gloucester Harbor. The weir and most of the traps met with poor success, the total value of the catch of all the traps being only $3,550. The number of men employed from June to September was twelve, and the value of the traps was about $1,000.

In the season of 1880 fourteen traps were set along the shores of Cape Ann from Manchester to Annisquam, employing forty-three men. The value of the traps and boats used in connection with them was $6,500, and the value of the products was $18,000.

The floating trap in use along the shore is square or rectangular in shape, and is made entirely

of netting. It is open at one end, where it is furnished with two stationary guides that lead obliquely into it from the ends of its sides and up from the bottom. These guides are made of netting, and have an opening between their inner ends. The trap is also furnished with movable wings made of netting that extend outwardly from the trap as leaders. Floats are attached to the upper edge of the trap, the guides, and the wings, so as to buoy the trap when in the sea, and to keep the sides in a vertical position and the bottom of the trap on that of the sea. The wings are not fixed to the bottom at their lower edges, but one of them is bent around or turned inward, and, by a line, is connected with the middle of another line that extends across the mouth of the trap. The other wing serves to direct the fish into the trap, and the bent wing intercepts and turns back any that might escape from it. The guides not only guide fish into the trap, but prevent the escape of those already in it. The trap is held in place in the sea by ropes leading from the upper edge of the trap to anchors. Fixed to the anchors and to the bottom of the trap are elastic stay-lines or connections that allow the bottom of the trap to conform to the surface of the bottom of the sea and hold it down thereon.

In front of the trap is a purse or pocket of netting, open at the top, where it is provided with a series of floats. The pocket communicates with the trap by an opening leading from one to the other at the upper part of the front end of the trap. To haul the trap, its bottom, at its rear end, is lifted off the bottom of the sea high enough to cause the fish to pass into the intercepting pocket. The dimensions of the traps vary; one of the most successful ones set off Gloucester is rectangular in shape, and is 25 fathoms long, 30 fathoms wide, and 5½ fathoms deep, and has a leader 40 fathoms long, reaching to the shore. The peculiar, though simple, construction of the trap, by which it is supported by anchors and brace lines, makes it specially suited for deep water or places where it would be difficult, if not impossible, to employ piles or merely a single line to each anchor. The kinds of fish taken include all the species commonly found on this coast, the most important being mackerel and herring. In the spring of 1880, when mackerel were very abundant inshore, many thousand barrels were taken in the traps near Gloucester. Most of them were tinkers, and too small for salting, so that but a small part of the catch was saved.

THE CLAM INDUSTRY.—The business of digging clams for bait and for food is carried on in the 'Squam River. The flats in this river are daily covered by the tide and afford good feeding ground for the clams. Ninety-two men are engaged in this business from October to May, and twenty men the balance of the year. The grounds are visited by men in their dories who wait for low tide, secure loads of the bivalves and return to shore, when the clams are sent in shell to market or "shucked" and sold for bait after being salted in barrels. Small houses are built upon the shore for the shelter of the diggers while engaged in "shucking." The diggers pay one of their number a certain percentage to act as agent for the sale of the clams. During the year 1879 the yield of clams amounted to 13,978 bushels, valued at $5,200, and the capital invested in dories, outfits, and buildings, was $2,000.

LOBSTER FISHERY.—This business is not extensively prosecuted at Gloucester. In and about the harbor and at Annisquam and Bay View during the year 1879, fifty-three men were engaged in taking lobsters, using for their capture the ordinary lobster pot, in form a half cylinder. The bait used was fish heads, sculpins, and sometimes haddock. The pots were set offshore at various depths varying from 1 to 12 fathoms. The catch was landed by the fishermen and at once sold to buyers who transported most of the lobsters by rail or boat to Boston. The principal season is from April to November. Forty-eight dories, valued at $960, and 1,324 pots, worth $1 each, were used to capture 133,340 lobsters, making 1,778 barrels, of a total value to the fishermen of $6,667.

DISTRIBUTION OF FISHERY PRODUCTS.—There has been for several years a growing tendency

among Gloucester merchants to distribute their products directly to large dealers throughout the country. Prior to 1860 the work of distributing fish taken by Gloucester vessels was very largely done at Boston, but to-day, although Boston handles in transshipment a vast amount of fish, yet but a small part of the Gloucester catch is sent there for distribution. Dealers are directly interested in the capture and cure of the fish, so that it is for their interest to prepare them in good shape and send them to market in the best condition. The curing and packing is done on the wharves where the fish are landed, and as soon as they are ready for shipment they are teamed to the cars or the steamboat landing or carried to the latter place on lighters built specially for this purpose.

Gloucester has good facilities for a wide distribution of the products of the fisheries, being on the line of the Gloucester branch of the Eastern Railroad, which connects with roads to all parts of the country. Besides the railroad communication there is a fleet of nineteen sailing vessels, 1,161 tons burthen, and a steamboat line constantly plying between here and the leading markets. The Cape Ann Advertiser states that the first steamer to sail regularly between Boston and Gloucester was the Mystic, run by the Gloucester Steamboat Company during the years 1860 and 1861, when she was chartered to the Government. At the beginning of the business most of the trade freight was billed to Boston only, and was confined mostly to barrels, halves, quarters, and kits of fish, and fish in 450-pound boxes and bundles. This trade from 1870 to 1873 warranted the running of a daily steamer carrying freight and passengers until late in the fall, when three trips were made per week during the winter. Business in 1875–'76 warranted building a new steamer making daily trips throughout the year. The steamers touch at East Boston and land their west-bound freight, connecting with all the fast freight lines over the Boston and Albany road, and then proceed to their berth at Central Wharf, where a connection is made with the Metropolitan Steamship Company with freight for New York and other points, and with the Philadelphia and Baltimore lines and all the inside lines to the South. Bills of lading are signed in Gloucester by all routes, rail or steamer, through to any point in the United States, and rates given, so that the business of transportation is now on such a footing that the Gloucester merchants have no trouble in doing business with connecting lines out of Boston. The trade has changed somewhat of late years, and fish is now packed for the market in all kinds of ways and size of packages, a large portion of the goods going West.

Fresh fish intended for market either in New York or the West are sent by rail rather than by steamboat. The halibut companies have for a number of years chartered cars for their sole use; these are loaded with fish and taken to Boston in season to connect with night trains for the New York and other great markets.

For the handling and transporting of fish in Gloucester there are employed sixty horses and a large number of low wagons called jiggers. In 1845, before the introduction of the railroad or steamboat lines, fish were shipped in sailing vessels. There was then little need for hauling fish, only two horses being thus employed. In 1850 there were not over half a dozen used for this purpose, but in 1880 the number had increased to sixty, valued, with wagons, at about $15,000.

FISH BOXES AND BARRELS.—Fish are shipped from Gloucester to all parts of the United States, to the West Indies, and to various parts of Europe. Brine-salted fish are packed in barrels, the size and material of which are regulated by the laws of the State. Dry fish are generally packed in boxes containing 400 to 450 pounds each, though a large part of this product is now made into prepared or boneless fish, and shipped in smaller boxes containing from 5 to 200 pounds. Fresh fish packed in boxes with ice are sent to all parts of the country, even as far west as California; such boxes usually containing 450 pounds of fish. These barrels and boxes are brought to Gloucester by rail and vessel from Maine, New Hampshire, Vermont, various towns in Massachu-

setts, and from the British Provinces. It is estimated that in the year 1880 there were consumed by Gloucester packers 150,000 barrels and 400,000 boxes, of a total value of $175,000. Most of the barrels are made in Maine and shipped to Gloucester in a condition ready for use. The boxes are brought here in the form of shooks and are nailed together by the packers, or at two factories in Gloucester, where some score of men are constantly employed in putting the pieces together and printing brands on the box-ends by the use of printing presses. Most of the boxes are made of spruce wood, which is stronger than pine and free from any unpleasant taste.

In the early history of the business fish were roughly handled, the dried fish being tied up in bundles of 1 or 2 quintals each, for shipment to Boston, where most of the distributing was done. Few fish are at present sent from Gloucester without being packed in boxes, and these few are preserved from damage by a wrapping of tea-matting. Dried fish intended for exportation to the West Indies are closely packed in what are called drums. These are barrels made usually of soft spruce wood, and are of five sizes, containing from 2 to 8 quintals of fish. The staves and heads are made in Maine, and put together in Gloucester.

FOREIGN TRADE.—Gloucester, next to Boston, has the largest amount of foreign commerce of any sea-port in Massachusetts. Its salt trade and exports of fish bid fair to increase from year to year. During the year 1879, 70 American and 31 foreign vessels arrived from foreign ports with cargoes of salt, fish, lumber, wood, potatoes, and other merchandise. Eighteen vessels were cleared with cargoes of fish, namely, 8 for Guadaloupe, 5 for Martinique, 2 for Barbadoes, and 1 each for Porto Rico, Surinam, and Trinidad. Twenty-two hundred vessels, not including fishing vessels, were boarded and inspected during the year by the customs officers of the port.

Prior to 1860 there were in Gloucester several mercantile houses running fleets of barks, brigs, and schooners to the East Indies, South America, West Indies, and other countries. The commercial interests of the place from 1790 to 1860 were mainly directed to Surinam, in Dutch Guinea. The imports were principally sugar, molasses, and cocoa, and aggregated in some years about $400,000, while the exports amounted to about $200,000. This business has been transferred to Boston, and now but a comparatively small quantity of the products destined for foreign markets are shipped direct from this port.

In 1878 an effort was made to re-establish the export trade of fish from Gloucester to the West Indies, and from March, 1878, to the close of 1879, 24 vessels took out cargoes. Seven of these sailed in 1878, and 19 in 1879, 15 of them clearing at the Gloucester custom-house and 11 at other ports. The cargoes taken by these vessels in 1878 included 1,234 casks, 867 boxes, and 625 drums, containing 2,821 quintals of cod, 1,702 quintals of haddock, 1,210 quintals of hake, 88 quintals of cusk, and 207 quintals of pollock; 514 barrels of mackerel, and 918 barrels of herring; making a total of 6,021 quintals of dried fish, and 1,432 barrels of pickled fish. Besides dry and pickled fish they took 275 pounds of butter, 8,000 feet of lumber, 155 bags of guano, 44 kits of cod tongues and sounds, 5 barrels of dried apples, 9,197 pounds of smoked halibut, and 2 cases of copper paint.

In 1879 the cargoes of the 19 vessels were 3,853 casks, 1,551 boxes, and 709 drums, containing 15,847 quintals of cod, 2,203 quintals of haddock, 1,174 quintals of hake, and 25 quintals of pollock; 1,130 barrels of mackerel, and 282 barrels of herring; making a total of 19,249 quintals of dried fish, and 1,412 barrels of pickled fish; also 5,086 boxes of smoked herring, 80 barrels of salmon, 100 barrels of bread, 180 barrels of potatoes, 1,750 pounds of butter, 84,724 feet of lumber, 15 casks, 48 bags of guano, 183 barrels of apples, 11 barrels of turnips, 40,000 shingles, 10 barrels of onions, 7 cords of wood, 640 bricks, 1 hogshead of tinware, and 1 chamber set.

The whole amount of dried and pickled fish shipped in the above vessels from March 28, 1878,

to November 18, 1879, was 25,270 quintals of the former and 2,934 barrels of the latter, having a total value of about $100,000.

The amount of cash, exclusive of that paid for freights, charters, and commissions, brought into Gloucester from abroad by these vessels during the above period was $95,112, which, with freights of $8,000 more, makes a total of $103,912. Of this amount nearly $12,000 was paid out in Gloucester for labor and other incidental expenses. For the preparation of the fish ten men were constantly employed, and a building was specially fitted for the artificial drying of the cured fish and the manufacture of drums and casks.

In 1876 there sprung up a foreign trade in pickled herring. The first cargo of these fish ever shipped to a foreign port from Gloucester was sent to Gottenburg in the spring of 1876, and within about twelve months was followed by ten other cargoes. The business has been continued with some success. Vessels have sailed during the past four or five years with cargoes of herring on Gloucester account from Newfoundland, bound for Sweden and other European countries.

ICE FOR PRESERVING FISH.—In the Gloucester fisheries there are annually consumed 25,000 tons of ice, valued in 1880 at $100,000. The greater part of this ice is used on board the vessels to preserve the fish fresh for market. George's-men take on an average 6 tons of ice per trip, using it for the preservation of bait and for fresh halibut. The fresh halibut fleet average 16 tons per trip, though in the summer season as high as 40 tons are often taken from Gloucester and consumed on a single trip, lasting three or four weeks. During the year 1879, Gloucester vessels made 1,132 trips to George's and 375 fresh-halibut trips, consuming about 14,000 tons of ice, while fresh-mackerel, haddock, and shore vessels used a large amount. A great quantity was also used in the shipment of about 15,000,000 pounds of fresh fish by rail to all parts of the country, going as far west as the Pacific coast.

Gloucester vessels began to carry ice about the year 1842, prior to which time halibut were brought to market largely in well-smacks. About 1845, ice-houses were built in the holds of the vessels, and the fish, as soon as caught, were dressed and preserved fresh for some days, or even weeks. Since about 1859 the fish have been shipped largely from Gloucester packed in boxes with ice, each box holding from 400 to 500 pounds of fish. The ice is usually cut from the ponds about Gloucester and stored in large houses erected for the purpose. During unfavorable seasons, as that of 1880, the supply is brought from distant places. The price varies from year to year, in 1879 the fishermen paid $2.50, while in 1880, owing to the warm winter, they were obliged to pay $4 per ton. There are two ice companies, in one of which the fishing firms are largely interested. Until 1878 one company controlled the entire business, but the demand for ice has so increased that two companies, with an invested capital of $50,000 in buildings, fixtures, horses, and wagons, find abundant profit. Forty men and about fifty horses are constantly employed in hauling ice in wagons to the wharves, where it is received by the crews of the vessels and stowed in ice-pens constructed in the vessel's hold.

SALT FOR FISH-CURING.—The fisheries of Gloucester consume an enormous quantity of salt. During the year ended December 31, 1879, 43,102,164 pounds, valued to the fishermen at $125,450, were withdrawn from the custom-house in this district for the curing of fish. In the early period of the fisheries much of the salt needed was brought from Spain and the West Indies by the fishing vessels that took their catch direct from the banks to those countries and exchanged it for salt. At the present day numerous ships, barks, and large schooners bring cargoes direct to Gloucester from Liverpool, Cadiz, and Trapani. It is imported by two firms which have extensive warehouses in Gloucester, and who sold it to the fishermen at an average of $1.63 per hogshead in 1879. The average price in Gloucester for the past eighteen years has been about $2.75 a hogs-

head. Cadiz salt is more extensively used than either of the other varieties. Trapani salt is generally used by cod fishermen bound on long trips, while Liverpool salt is used in pickling mackerel and herring.

The quantity of salt taken by fishing vessels varies very much, and is determined by the kind of fishery and the length of the intended trips. Grand Bank cod fishermen absent from home from two to four months or more average 210 hogsheads, though some of the largest vessels take as high as 300 hogsheads, or about 80 tons, of salt on a single voyage, while the shore cod fishermen may take either a few bushels or none at all, their fish being cured on the wharves. Cod fishermen carry their salt in bulk, but the mackerel catchers take it in barrels which are afterwards used for packing the fish. The quantity of salt required for curing various kinds of fish is discussed in the chapter on methods of curing.

Salt withdrawn from warehouses to be used in the curing of fish is free of duty, this drawback in a measure taking the place of the bounty formerly allowed to fishing vessels. Reference to the chapter on marine salt will show the amount consumed by the various fishing ports and the amount of duty saved during a period of years. Two concerns and twenty-six men are constantly employed in handling salt in Gloucester. The invested capital in buildings for storage is $16,000, and the cash capital for carrying on the business is $25,000.

For many years prior to 1861 there were very few direct importations of salt into Gloucester, but since that date many ship-loads have arrived from foreign ports. In 1870, 45,000 hogsheads of salt were imported in 7 brigs and 10 barks. In 1875 the importations were 108,486 hogsheads in 2 ships, 12 barks, 12 brigs, and 16 three-masted schooners. Of these 42 vessels, 34 were under the American, 5 under the English, and 3 under the Austrian flag. The amount used in curing fish in the year 1875 was 106,245 hogsheads.

The wholesale price of salt in Gloucester each year since 1860 has been an average of about $2.75 per hogshead of 560 pounds. The prices, per hogshead each year, were as follows:

Year.	Price.	Year.	Price.	Year.	Price.	Year.	Price.	Year.	Price.	Year.	Price.	Year.	Price.
1860	$2 00	1863	$2 25	1866	$4 25	1869	$2 87	1872	$2 25	1875	2 00	1878	$1 62
1861	2 00	1864	3 62	1867	4 00	1870	2 87	1873	2 12	1876	1 75	1879	1 63
1862	2 00	1865	6 50	1868	3 12	1871	2 37	1874	2 25	1877	1 62	1880	1 75

Up to 1873 salt withdrawn for curing fish on board of vessels licensed for the fisheries was free of duty, but that used on shore for curing fish was subject to a duty of 8 cents per 100 pounds. Since 1873 all salt withdrawn for curing fish has been duty free. The amount used yearly in Gloucester for this purpose during the past eight years, and the wholesale value of the same has been as follows:

Year ended June 30—	Pounds.	Value.	Year ended June 30—	Pounds.	Value.
1873	38, 874, 776	$147, 390	1877	58, 544, 962	$170, 400
1874	48, 944, 728	196, 650	1878	44, 504, 477	138, 750
1875	50, 558, 751	180, 560	1879	38, 098, 454	110, 864
1876	56, 707, 427	177, 216	1880	43, 567, 922	135, 000

PROVISIONS USED BY THE FLEET.—The annual consumption of agricultural products by the Gloucester fishing fleet is very large and includes a great variety of articles, as may well be supposed when we consider that nearly 4,500 men must be fed during the greater part of the year. The value of provisions consumed on the vessels during the year 1879 is estimated at $310,000,

and included the following items: Rice, 25,920 pounds; flour, 6,912 barrels; sugar, 128,640 pounds; molasses, 29,376 gallons; beef, 4,104 barrels; pork, 864 barrels; pork shoulders, 1,512 barrels; lard, 13,072 pounds; butter, 210,248 pounds; beans, 1,720 bushels; peas, 864 bushels; dried apples, 64,800 pounds; potatoes, 35,826 bushels; onions, 2,592 bushels; beets, 1,296 bushels; turnips, 1,728 bushels; cabbages, &c., $12,960 worth; vinegar, 2,592 gallons; fresh beef, 86,400 pounds. It is estimated that 1,262,888 pounds of cotton were used in sails and fishing-lines on the Gloucester fleet in 1879.

THE GLOUCESTER FISHERIES, 1870 AND 1871.—The United States census report gave the following items concerning the Gloucester fisheries for the year ending June 30, 1870:

The whole number of industrial pursuits was 160, of which number 48 were engaged in the fishing business; capital invested, $2,357,700; number of men employed, 4,629; amount of wages paid, $1,410,923; number hogsheads of salt used, 54,890; value of salt used, $158,246; number of barrels, 109,032; value of barrels, $110,004; value of bait, $236,011; number of quintals codfish, 189,033; value of codfish, $1,243,776; number of barrels mackerel, 85,834; value of mackerel, $1,186,009; number of barrels oil, 3,113; value of oil, $78,457; value of other fish, $330,128; total value of fish products, $2,838,370.

The report of the town clerk gives the following concerning the fishing business of Gloucester for the year ending December 31, 1870:

The whole number of schooners and boats fitted for fishing was 471. The value of the products of the fisheries was $3,613,105, estimated as follows, from custom-house returns and fish inspector's report: 210,000 quintals codfish, valued at $1,260,000; 129,595¼ barrels mackerel, $1,814,330; 12,000 barrels herring, $72,000; 6,560,000 pounds fresh fish, $262,400; 26,000 quintals other fish, $78,000; 120,000 gallons oil, $90,000; 18,000 barrels shell fish, $18,000; miscellaneous, $18,375; total, $3,613,105."

For the year ending December 31, 1871, the town clerk gives the following statistics:

"The whole number of schooners and boats fitted for fishing was 465. The value of the products of the fisheries was $2,918,022, estimated as follows, as compiled from the custom-house returns, fish inspector's reports, and other sources: 303,055 quintals codfish, valued at $1,363,747; 33,250 quintals other fish, at $66,500; 7,836,500 pounds fresh fish, $225,095; 160,000 gallons oil, $96,000; 107,008 barrels mackerel, $1,070,080; 15,000 barrels herring, $52,000; 18,000 barrels shell fish, $18,000; miscellaneous, $26,600; total, $2,918,022."

THE FISHERIES IN 1872.—The Gloucester Telegraph gives the following figures of the fishing industry of the town for the year ended November 15, 1872:

"In the herring fishery 18 vessels made trips to Newfoundland, 24 to Grand Menan (5 making two and 5 making three trips each) and 2 to Bay of Islands. One man was lost overboard. During the previous year 59 vessels made herring trips, and 2 vessels were lost.

"The winter haddock fishery was but partially successful, owing to unfavorable weather in February and March. One vessel was lost.

"The Bank fishery (exclusive of George's) employed 101 vessels (against 81 the previous year) and 339 fares were landed, an increase of one-third over the previous year. Four vessels and 49 lives were lost. Last year the loss was 4 vessels and 24 lives.

"The George's fishery employed 182 vessels, and the receipts were 800 fares, an increase of 48 over the previous year. One vessel and 11 lives were lost against 10 vessels and 97 lives in 1871.

"The Bank and George's fisheries were uniformly successful.

"The Greenland fishery employed 6 vessels (two more than the previous year) all of which were successful and free from disaster.

"The mackerel fishery employed some 40 or 50 vessels in the spring fishery at the South, about 100 vessels in the offshore summer fishery, and 60 vessels (an unusually small fleet), in the Bay Saint Lawrence.

"Seven vessels were lost in the pohagen and other offshore fisheries in the summer and fall months."

THE FISHERIES IN 1873.—The Gloucester Telegraph of November 19, 1873, gives the fishing record for that year as follows:

"The fishing season will be brought to a close with the arrival of the Bay Saint Lawrence fleet, of which but 12 vessels remain to arrive. The season has been a disastrous one in losses of life and property, though but for the unusual losses it would have been a moderately profitable one. So far as the fishermen themselves are concerned, whose lives have been spared, the business has yielded good returns, the catch having been large and the prices fair, and the loss has fallen on the capital invested in the business, most of the establishments coming out with a small range of profits, if not with absolute loss.

"The Newfoundland fresh herring fishery last winter employed 18 Gloucester vessels, nearly all of which marketed their catch abroad, some 1,500 barrels only being disposed of here in baiting the Bank fleets. The schooner Thorwaldsen, with a crew of 7 men, was lost in this business.

"The Grand Manan fresh herring business gave employment to 38 vessels, 5 of which made two trips each, and 1 making three trips, during the season. The schooner Franklin A. was lost on the return trip from New York, after having disposed of her herring fare in that market.

"Six Gloucester vessels engaged in the Bay of Islands salt-herring fishery. The shore fishery for cod was actively pursued during the winter months with average success, a portion of the Gloucester fleet, however, rendezvousing at Portsmouth, N. H., where they found a ready market for their catch.

"The Grand and Western Bank fishery employed one hundred and fifty Gloucester vessels during the year ending November 15, 1873, and six vessels belonging elsewhere landed fares here. Quite a number of the Gloucester fleet continued in this branch of the fisheries throughout the year. The fleet was at its minimum during the quarter embracing the months of November, December, and January, when the whole number of fares received was 62 in the three months; and at its maximum at the close of spring, during the summer, and opening of fall, the number of fares received being 74 in May, 41 in June, 62 in July, 61 in August, and 46 in September. The fleet was successful throughout the season, the Western Bank yielding good fares of halibut, which commanded high prices, and the catch of codfish on Grand Bank being unusually large and the fish of superior quality. The number of bank fares landed during the year was 463 against 339 the previous year.

"The George's fishery was followed during the year to a greater or less extent by one hundred and seventy-five vessels, being at its height in May, in which month 169 fares were received. The total fares received for the year ending November 15, were 779 against about 800 the previous year. The catch was good, and prices ruled well.

"In the mackerel fishery, the southern fleet in the spring was of usual size, embracing fifty-four vessels, and fairly successful, marketing their earlier catch in New York at good prices. The summer fishery off the shores of Maine, New Hampshire, and Massachusetts was of respectable size, and mostly engaged in the seining of mackerel, with a very good average success, although a few vessels did not pay expenses. Eighty-six vessels engaged in this business.

"The Bay Saint Lawrence fleet was unusually large, consisting of one hundred and eighty-five vessels, against sixty last year. The catch was good, and the business would have proved quite successful but for the disastrous gale in August, by which so many vessels were wrecked or temporarily disabled in the height of the fishing season, materially reducing the receipts. Of the one hundred and eighty-five Gloucester vessels engaged in this fishery, ten were wrecked and are total losses, and three remain ashore at the Magdalen Islands, but are not abandoned. Twenty-six vessels made two bay trips each during the season, and the whole number of fares received at Gloucester this season will be 198 against 65 last year.

"The Greenland fishery employed four vessels, meeting with only moderate success. The Iceland fishery employed one vessel, which failed to secure a fare."

THE PRODUCTS OF GLOUCESTER FISHERIES IN 1875.—Prepared from actual returns obtained by Mr. George H. Proctor, of the Cape Ann Advertiser:

Products.	Amount.	Value.	Products.	Amount.	Value.
Bank codfish ..... quintals..	177,473	$998,628	Mackerel—Continued.		
George's codfish ..... do ..	185,758	1,021,669	No. 3 ..... barrels..	21,763	$174,104
George's halibut ..... pounds..	2,462,364	172,365	No. 4 ..... do....	4,039⅜	24,205
Bank halibut ..... do....	7,248,413	507,389	Herring ..... do....	3,175	13,494
Hake ..... quintals..	4,257	12,774	Pickled codfish ..... do....	163	1,097
Cusk ..... do....	2,349	7,047	Swordfish ..... do....	40¼	
Pollock ..... do....	9,417	32,964	Trout ..... do....	410⅝	4,042
Herring ..... barrels..	38,292	153,168	Fins and napes ..... do....	75¾	
Shore-fish:			Salmon ..... do....	217	2,282
Fresh	.....	89,738	Tongues and sounds ..... do....	205	
Cured	.....	135,697	Shell-fish	.....	10,000
Oil	.....	8,945	Other fish	.....	8,000
Mackerel:			Fish oil, other than shore	.....	100,000
No. 1 ..... barrels..	18,172⅝	327,112	Total value	.....	3,989,500
No. 2 ..... do....	7,065⅛	184,780			

The items of shore, fresh, and cured fish and oil in the above statement include the following:

Products.	Amount.	Value.	Products.	Amount.	Value.
Fresh fish:			Cured fish—Continued.		
Codfish ..... pounds..	1,476,755	.....	Hake ..... quintals..	8,434	.....
Haddock ..... do....	816,348	.....	Pollock ..... do....	7,372	.....
Pollock ..... do....	280,983	.....	Haddock ..... do....	1,512	.....
Hake ..... do....	195,256	.....	Cusk ..... do....	724	.....
Cusk ..... do....	40,048	.....	Fish roes ..... barrels..	143	.....
Swordfish ..... do....	14,581	.....	Hake sounds ..... pounds	5,276	.....
Mackerel ..... numbers..	246,607	.....	Tongues and sounds ..... barrels..	345	.....
Flounders ..... do....	16,646	.....	Porgy slivers ..... do....	273	.....
Lobsters ..... barrels..	1,675	.....	Oil:		
Perch ..... do....	15	.....	Dogfish oil ..... gallons..	11,040	.....
Fresh livers	.....	$9,875	Medicine oil ..... do....	3,640	.....
Cured fish:			Porgy oil ..... do....	1,240	.....
Codfish ..... quintals..	12,712	.....	Hake oil ..... do....	720	.....

THE FISHERIES IN 1877.—From the Cape Ann Advertiser, of January 4, 1878, we have the following review of the fisheries for the year 1877: The number of fishing arrivals in the herring, cod, halibut, and mackerel fisheries, exclusive of the boat and shore fishermen, have averaged over 50 per week, the aggregate for the year being 2,680, as follows: Newfoundland, 28; Grand Manan, 37; Grand, Western, and La Have Banks, 556; George's, 1,281; shore mackerel trips, 692;

Bay Saint Lawrence, 86. The herring fleet met with their usual success, and the cod and halibut fisheries have been fairly profitable. The Bank and George's fleets have landed over 28,000 tons of green fish, or enough to load a train of cars 50 miles in length. Prices have been well maintained throughout the year, and most of the stock has been closed out."

The products for 1877, as given in the Fisherman's Own Book, exclusive of shore-fish and oil, were 23,755,000 pounds George's codfish, 16,865,000 pounds Bank codfish, 14,319,000 pounds Bank halibut, 1,814,000 pounds George's halibut, 850,000 pounds flitched Bank halibut, 100,000 pounds Greenland halibut, 49,044 barrels mackerel, 28,500 barrels herring. Eighty-six Gloucester vessels fished for mackerel in the Bay of Saint Lawrence this year.

THE FISHERIES IN 1878.—The Advertiser of January 3, 1879, says:

"There were 2,180 arrivals during the year, averaging half a dozen a day, from the more important fishing grounds. The arrivals do not include the boat and dory fishermen, the short trips off shore in the winter cod and haddock fisheries, while only a part of the shore mackerel arrivals in summer are reported. The number of Bank trips was 503, George's 1,234, Grand Manan, Bay of Fundy, and Eastport (herring), 30; Newfoundland and Magdalen Islands, 18; Greenland halibut fishery, 2; Southern and Eastern mackerel trips, 280; Bay of Saint Lawrence mackerel trips, 113."

The products for 1878, as given in the Fisherman's Own Book, exclusive of shore-fish and oil, were 24,158,000 pounds George's codfish, 12,202,500 pounds Bank codfish, 10,914,500 pounds Bank halibut, 524,100 pounds George's halibut, 120,000 pounds Greenland flitched halibut, 55,742 barrels mackerel, 27,000 barrels herring. This was the year when the herring fleet was driven away from the shores of Newfoundland. One hundred and twenty-five fares, about 30,000 barrels, sea-packed mackerel, were received from the Bay of Saint Lawrence.

THE FISHERIES IN 1879.—The Advertiser of December 24, 1879, gives the following review for that year:

"The fishing fleet of Gloucester the present year has numbered 429 vessels, of which 338 are owned here, and 91 belong in other places, but have made this their headquarters for the whole or a part of the active fishing season. We have had during the year a fleet of 104 Gloucester schooners constantly employed in the George's fishery, many of them making over a dozen trips each, and 48 other vessels have followed the branch a part of the season, making one or more trips, the 152 vessels making over 1,000 trips, and landing at this port 23,144,000 pounds of codfish and 995,500 pounds of fresh halibut. Eighty-two Gloucester vessels have been employed all the year in the Bank fishery, some making one or two trips cod fishing and quite a number following the halibut fishery and making five or ten trips each during the season. Thirty-two other Gloucester vessels and 11 belonging elsewhere have made one or more bank trips during the season, giving us a total Bank fleet of 125 schooners, making over 500 trips, and landing at the Gloucester wharves 13,247,000 pounds of codfish and 11,717,400 pounds of halibut. The shore cod fishery was active for a part of the season, and employed 47 Gloucester vessels and 47 belonging elsewhere, making a total fleet of 94 vessels, which made nearly 200 trips, and landed here 3,742,000 pounds of codfish. Concerning the rest of the fishing fleet, it is difficult to give accurate statistics. Most of the southern mackerel fleet and a portion of the offshore fleet followed the market fishery, selling their catch fresh in New York and Boston. Many of the vessels salting their catch sold them from the pickle, without inspection, so that they go to the credit of other fish markets. The mackerel inspection of Glocester is estimated at 47,085 barrels of shores and 7,125 barrels of bays, making a total of 54,210 barrels. The Bay of Saint Lawrence fleet numbered about 25 vessels. About 100 Gloucester vessels and 30 belonging elsewhere made this their headquarters in the shore mackerel fishery for

a greater or less part of the season. The number of arrivals reported at this port in the shore mackerel industry for the season was about 250. Three vessels engaged in the Greenland fishery, bringing home about half a million pounds of flitched halibut. Eight vessels followed the squid fishery, making two trips each, one off the Southern coast and one to Newfoundland, meeting with indifferent success. Over a score of vessels were employed in the Eastport, Grand Manan, and Bay of Fundy herring fishery, and half a score made herring trips to Newfoundland. Leaving out of account the receipts of mackerel and herring, and the item of fish-oil, we cannot be far out of the way in estimating that, including the catch of boat and dory fishermen, the average weekly receipts of fish at this port for the current year has been fully 1,000,000 pounds.

"This is a large showing for a single fishing port, because, as a rule, the business is only carried on elsewhere as one element of a varied industry. Gloucester gives her sole energy to this productive enterprise, practically speaking, and would be unfortunate indeed if she did not reap commensurate results, placing her at the head of the list of fish-producing communities. The returns are not excessive for the amount of capital and talent and labor and risk involved; and while in some cases vessels have been fortunate in securing large fares, moderate success from constant and patient delving has been the rule, and it is only through extensive operations that large results have been secured. The catch has found a ready sale all through the year, and, with an almost bare market, the outlook for the fishing industry in 1880 is a most encouraging one."

THE FISHERIES IN 1880.—The following review for the year 1880 appears in the Advertiser of January 14, 1881:

"The Gloucester fishing fleet for 1880 numbered 441 vessels, of which 334 belonged to this port, 11 in Rockport, 81 to other New England ports, and 15 to the British provinces. Some of the outside vessels visited Gloucester only once or twice, to avail themselves of the advantages of our market in disposing of their Bank, herring, or shore catch, but a very respectable portion of the number made Gloucester their headquarters during the greater part of the fishing season, or throughout the year.

"We find by reference to our files that 163 vessels from this port were engaged in the George's fishery at some time during the year, a part of which made a few George's trips during the height of the season, engaging in other branches of the fisheries subsequently. One hundred and seven vessels, however, followed the George's fishery exclusively, many of them making 14 trips or more during the year. Twenty made trips to George's and the bay; 20 made George's and mackereling trips; 5 were in the George's and Grand Manan fisheries; 4 engaged in the George's and shore cod-fisheries; 3 went to George's, the Banks and mackereling; 2 to George's, mackereling and Grand Manan; 1 to George's and squidding; and 1 to George's, the Banks, and shore fishing.

"The 163 vessels engaged at different times in this branch of the fisheries employed about 1,800 men, and made during the year 1,430 trips, landing 27,000,511 pounds of codfish, and 1,125,450 pounds of halibut, an increase over the previous year of 10½ per cent.

"The number of vessels engaged in the Bank cod and halibut fisheries during the year was 133, of which number 90, employing about 1,200 men, followed the Bank fisheries throughout the year. Twelve were engaged in Bank fishing and mackereling; 4 in the Bank and herring fisheries; 1 in the Bank herring and mackerel fisheries; 1 in the Bank and shore cod-fisheries; 1 went to the Banks and Greenland, and 24 to the Banks, George's, &c., as above stated. But few of these vessels made the long trip, occupying all the season, as was formerly the practice, finding better returns in shorter trips and quicker handling of fares. The halibut fleet made from ten to a dozen trips each, and being considerably smaller than for the previous year made good stocks on a much smaller aggregate catch. The total Bank fleet included in our figures made 249 trips for codfish,

and 261 for halibut, making a total catch of 20,000,247 pounds of the former, and 7,000,940 pounds of the latter. This shows an increase over the previous year of about 7,000,000 pounds in the Bank codfish catch, and a decrease of about 4,000,000 pounds in the catch of Bank halibut.

"The mackereling industry employed 175 vessels, and about 2,500 men; the number of vessels engaging in no other fishing branch for the year, was 90. Fifteen were employed in mackereling and the shore fishery; 27 in mackereling and the herring fishery; 5 in mackereling, the herring, and shore fisheries; and 38 in the mackerel, George's, and Bank fisheries, &c., as indicated above. The Block Island mackereling fleet comprized 15 vessels, the Southern fleet 34, and the Bay Saint Lawrence fleet 15, all of which were also successfully engaged in the offshore mackerel fishery. Most of the Southern fleet disposed of their catch, in large proportion fresh, in the Philadelphia, New York, and Boston markets; the Bay Saint Lawrence trips were failures; the Block Island catch was smaller than in 1879; but the shore catch was larger than for many years, and proved profitable. The total catch is estimated at 129,620 barrels.

"The shore cod fishery was less profitable than in previous years, the schools of fish failing to appear in their inshore haunts. The fleet numbered 56 vessels, of which about one-half were also engaged during a part of the year in other branches of the fisheries. The number of fares landed was 96, aggregating 1,000,720 pounds, or about one-half the quantity reported in 1879.

"The herring fisheries employed 50 vessels, most of which were also engaged in other fisheries, as already indicated. The number of trips made was 79, and the catch about 30,000 barrels, or twice the quantity received in 1879.

"There were also half a dozen vessels engaged in squiding, a winter fleet of large vessels in the fresh cod and haddock fishery, and a respectable fleet of small craft following the market cod and haddock fishery all the season, whose catch, together with that of the dory fishermen, if we were able to present the figures, would swell the Gloucester product to very considerable figures, and substantiate her claim to the first rank in the list of food-producing communities on this side of the Atlantic."

THE GLOUCESTER FISHERIES IN 1881.—The following review for 1881, though not properly belonging to the census report, is given here to show the increase in the industry since 1879. It appeared in the Cape Ann Advertiser of January 6, 1882:

"The Gloucester fishing fleet for 1881 numbered 437 vessels, or 4 less than for the previous year. The Gloucester vessels numbered 343; 17 belonging elsewhere fished from Gloucester the greater part of the season, and 77 others made one or more trips here during the year. The George's fleet, pursuing that fishery all the season, was considerably smaller than in 1880—62 against 107—but 163 vessels, the precise number as for the previous year, were engaged at some time during the year in the George's fishery. Twenty-six vessels confined their operations to the Western Bank fishery, 10 were engaged exclusively in the Grand Bank cod fishery, 25 made Bank halibuting trips only, and 29 were employed only on shore and Bay of Fundy cod fishing trips. One hundred and eight vessels, however, made more or less Western Bank trips during the year, 24 Grand Bank cod fishing trips, 32 Bank halibuting trips, 40 were engaged in the shore cod fishery, and 48 visited the Bay of Fundy. The summer mackerel fleet numbered 149 vessels, 81 of which confined their operations for the year to this department. The Grand Manan fleet numbered 45 vessels. The other fishing grounds visited by the Gloucester fleet were Brown's Bank, Cape Shore, Greenland, Newfoundland, La Have Bank, Cape North, Banquereau, Seal Island grounds, Cape Sable, &c.

"The table below shows the fish receipts at this port in the leading departments of the industry for the past three years, the La Have and Brown's Bank catch being credited to the George's

fishery, the Bay of Fundy catch to the shore fishery, and the figures in the Bank fishery including Grand and Western Banks, Banquereau, the Cape Shore, and other distant fisheries:

Products.	1881.	1880.	1879.
Bank codfish ..... pounds..	20, 955, 280	20, 247, 000	13, 247, 000
George's codfish ..... do....	22, 510, 000	27, 511, 000	23, 144, 000
Shore codfish ..... do....	3, 245, 300	1, 721, 000	3, 742, 000
Total codfish ..... do....	46, 710, 580	49, 479, 000	40, 133, 000
Bank halibut ..... do....	7, 178, 800	7, 940, 000	11, 717, 400
George's halibut ..... do....	1, 087, 400	1, 125, 450	995, 500
Fletched halibut ..... do....	25, 000	.....	.....
Greenland halibut ..... do....	428, 290	.....	500, 000
Total halibut ..... do....	8, 719, 490	9, 065, 450	13, 212, 900
Total cod and halibut ..... do....	55, 430, 070	58, 544, 450	53, 245, 900
Mackerel ..... barrels..	*163, 851	*129, 620	†48, 643
Frozen herring ..... number..	13, 318, 000	9, 000, 000	6, 000, 000

* Sea-packed. † Inspected.

"For the closing five months of 1881, the shore fleet landed at this port 983,500 pounds hake, 586,000 pounds pollock, 324,000 pounds haddock, and 40,000 pounds cusk; total shore fish otherwise than cod, 1,933,000 pounds; shore herring catch, 8,632 barrels.

"The fish receipts at this port from Maine and the Provinces during the last four months of the year were as follows: 9,370 quintals hake, 8,030 quintals codfish, 2,905 quintals haddock, 25 barrels herring; 32 barrels fish-oil; 5,500 boxes smoked herring."

LOSSES OF LIFE AND PROPERTY.—The Gloucester fisheries have been prosecuted only at the risk of life and property. Each year has its dark record of disasters, and many are the sad hearts in Gloucester who mourn husband, father, or brother lost on the fishing banks. The George's fishery has been the most disastrous of any single fishery. In a single gale in February, 1879, 13 vessels were lost with 143 men, leaving 50 widows and 115 children to watch in vain for their return. The years 1862, 1871, 1873, 1875, 1876, and 1879 have very dark records. The helpless ones left behind are assisted by the generous contributions of warm hearts all over the land. A charitable organization exists in Gloucester known as the Fishermen's Widows and Orphans Aid Society, which annually distributes moneys contributed by the fishermen, who give ¼ of 1 per cent. of their gross earnings for this purpose.

The total losses in the Gloucester fisheries during the period from 1830 to 1881, as recorded in the Fishermen's Own Book, published at Gloucester, has been 2,249 lives and 419 vessels. These vessels were valued at $1,810,710, and were insured for $1,355,418. The yearly record of losses is as follows:

Year.	Vessels.	Tonnage.	Value.	Insurance.	Lives.	Year.	Vessels.	Tonnage.	Value.	Insurance.	Lives.
1830	3	.....	$5, 600	$3, 100	7	1841	2	.....	$2, 725	$150	8
1831	.....	.....	.....	.....	.....	1842	3	.....	2, 000	150	.....
1832	1	.....	1, 000	.....	.....	1843	3	.....	6, 000	2, 000	10
1833	1	.....	1, 000	.....	.....	1844	3	.....	4, 800	1, 500	7
1834	1	.....	1, 500	.....	4	1845	4	.....	4, 500	2, 350	8
1835	.....	.....	.....	.....	.....	1846	3	.....	4, 900	3, 600	15
1836	.....	.....	1, 000	.....	.....	1847	3	.....	6, 200	4, 450	.....
1837	5	.....	10, 100	4, 300	21	1848	.....	.....	.....	.....	.....
1838	4	.....	7, 100	3, 000	4	1849	2	.....	3, 500	2, 200	10
1839	2	.....	3, 800	3, 150	4	1850	4	.....	12, 500	10, 300	31
1840	2	.....	3, 800	1, 400	6	1851	9	.....	25, 300	21, 800	32

Yearly record of losses—Continued.

Year.	Vessels.	Tonnage.	Value.	Insurance.	Lives.	Year.	Vessels.	Tonnage.	Value.	Insurance.	Lives.
1852	13	.....	$41,200	$37,100	40	1868	4	282.27	$35,000	$28,150	39
1853	3	.....	10,000	8,800	.....	1869	16	858.81	83,450	54,887	65
1854	4	.....	14,600	12,650	26	1870	13	788.15	75,200	59,907	97
1855	7	.....	20,900	16,100	21	1871	20	1,035.93	90,560	78,253	140
1856	6	.....	14,400	11,475	2	1872	12	576.68	55,400	49,121	63
1857	5	.....	11,500	7,750	9	1873	31	1,624.55	118,700	100,918	174
1858	7	.....	18,700	8,537	42	1874	10	633.17	49,100	44,975	68
1859	6	.....	21,900	16,475	36	1875	16	1,050.91	96,000	81,326	123
1860	7	.....	26,350	20,494	74	1876	27	1,075.46	150,000	116,222	212
1861	15	.....	54,250	43,900	44	1877	8	722.33	45,000	22,000	39
1862	19	.....	66,500	53,225	162	1878	13	907.57	64,794	49,967	56
1863	10	.....	40,700	8,300	6	1879	29	1,893.36	111,056	90,582	249
1864	13	.....	98,900	59,625	84	1880	7	300.44	21,000	15,972	52
1865	8	504.93	40,300	32,400	11	1881	8	511.51	31,000	20,493	56
1866	15	1,055.00	114,250	82,095	26	Total	419	.....	1,810,710	1,355,418	2,249
1867	11	844.57	82,675	59,069	66						

61. THE FISHERIES OF MANCHESTER.

MANCHESTER.—This town joins Gloucester on the east and Beverly on the west. It is 23 miles northeast from Boston, on the line of the Eastern Railroad. It has a good and safe harbor for vessels not over 120 tons burden. The population of the town in 1840 was 1,355, at which date the place was engaged in the cod and mackerel fisheries, having a fleet of eleven sail, measuring about 650 tons. In 1880 the number of inhabitants was 1,640. The fisheries have steadily declined; in 1879 not a single fishing vessel belonged here. While the fishing industry has decreased, the place has grown in wealth as a favorite sea-side resort, and many beautiful cottages and hotels dot the shores.

At the entrance of the harbor there are set during the summer months several floating traps for the capture of mackerel and other fish. These are owned and worked by Gloucester fishermen. The number of these traps in 1880 was five, valued at $2,000, and the number of men employed was sixteen. The production amounted to $2,300 worth of fish, some of which was sold to fishing vessels for bait. There has been much opposition to the use of these traps, the summer boarders claiming that they are a nuisance because of refuse fish washed ashore. The result of this opposition has provoked considerable discussion in the State legislature; but as nothing could be proved against the traps, they continue to be used.

The only branch of fishery engaged in by Manchester fishermen is for the capture of lobsters, and this only to a very limited extent. The number of men employed is 12; number of dories 11, valued at $220; number of lobster-pots, 425, valued at $425; and the number of lobsters taken, 8,250, or 110 barrels, valued at $412. The lobsters are peddled around town, being sold mostly to summer boarders. Seaweed that is driven upon the beaches is sold by the town authorities to farmers, who use it for fertilizing purposes.

D.—THE DISTRICT OF SALEM AND BEVERLY.

62. REVIEW OF THE DISTRICT.

PRESENT CONDITION OF THE FISHERIES.—In the customs district of Salem are included the fisheries of Beverly and Salem. The former place at one time had a large fleet of vessels in the Bank cod fishery, but the fleet is now much reduced in numbers. Salem was in former years an important fishing station, but it has now become an important manufacturing and commercial city. The number of vessels belonging in this district is thirty-six, valued, with their outfit and apparatus, at $105,139. The total capital invested in the fisheries is $209,784, and the value of the products is $117,444. The number of persons employed in fishing or preparing fishery products is three hundred and twenty.

STATISTICAL SUMMATION FOR 1879.—The following statement gives in detail the extent of the fishing interests of Salem district:

Summary statement of persons employed and capital invested.

Persons employed.	Number.	Capital invested.	Amount.
Number of vessel-fishermen	208	Capital in vessels and boats	$106,300
Number of boat-fishermen	49	Capital in nets and traps	3,484
Number of curers, packers, fitters, &c	63	Other fixed and circulating capital	a100,000
Total	320	Total	209,784

a Cash capital, $20,000; wharves, shorehouses, and fixtures, $80,000.

Detailed statement of capital invested in vessels, boats, nets, and traps.

Vessels and boats.	No.	Tonnage.	Value.	Value of gear, exclusive of boats and nets.	Value of outfit.	Total value.	Nets and traps.	No.	Value.
Vessels.							*Nets.*		
In food-fish fishery:							Gill-nets:		
Active	20	1,090.63	$41,125	$7,075	$25,815	$74,015	In vessel fisheries	7	$84
Idle	14	650.68	20,700			20,700	Purse-seines:		
In oyster fishery	1	130.00	5,000		100	5,100	In vessel fisheries	3	1,500
In squid fishery	1	32.25	1,000	100	400	1,500	Total	10	1,584
Total	36	1,903.56	67,825	7,175	26,315	101,315	*Traps.*		
Boats.							Weirs, &c	2	600
In vessel fisheries	91		2,240			2,240	Lobster and eel pots	1,300	1,300
In shore fisheries	29		805	690	1,250	2,745	Total	1,302	1,900
Total	120		3,045	690	1,250	4,985			

Detailed statement of the quantities and values of the products.

Products specified.	Pounds, fresh.	Pounds, prepared.	Bulk.	Value, prepared.
Grand total				$117,444
Fresh fish.				
Cod	491,500			7,373
Cunners	6,000			30
Cusk	800			6
Eels	1,000			50
Flounders	3,000			45
Haddock	148,700			1,978
Hake	26,000			156
Mackerel	20,000			266

Detailed statement of the quantities and values of the products—Continued.

Products specified.	Pounds, fresh.	Pounds, prepared.	Bulk.	Value, prepared.
Fresh fish—Continued.				
Pollock	3,000			$12
Smelts	500			13
Mixed fish	130,000			650
Total	830,500			10,579
Dry fish.				
Cod	4,144,000	1,450,400		52,214
Pickled fish.				
Mackerel	433,800	289,200		8,314
Swordfish	3,500	2,000		65
Mixed fish	6,000	4,000		100
Total	443,300	295,200		8,479
Shell fish.				
Lobsters	422,250			15,482
Oysters				a26,000
Total	422,250			41,842
Miscellaneous.				
Squid			325 barrels	1,950
Fish oil			6,475 gallons	2,590
Seaweed			150 tons	150
Total				4,690

a Enhancement on southern oysters.

63. THE FISHERIES OF BEVERLY AND SALEM.

BEVERLY.—Beverly, situated 18 miles east from Boston, has a fine rock-bound harbor with 15 feet of water at low tide. In the early history of the State it was known as the home port of a large portion of the New England Grand Bank fleet of cod-fishermen. At one time ship-building was carried on to a considerable extent at this place, large, square-rigged vessels, as well as fishing schooners, being launched from this port. With the exception of a few small yachts no vessels have been built here for many years, and only one of 20 tons during the year 1879. Concerning the reduction in the number of mackerel vessels and bankers sent from this port of late, Mr. Crittenden writes:

"Beverly sends no mackerel catchers this year, 1879; she sends ten bankers, each of which makes but one trip a year. It is not long since there were seventy bankers sailing from here, each one of which made two trips a year. There is some small boat fishing carried on."

The crews of the fishing vessels at one time fished on shares, receiving five-eighths of the proceeds and the vessel three-eighths, the expenses of the vessel being first paid. Of late years, however, and at the present time, there is no uniform rule as to how the crew shall be paid.

The hand-line and trawl are both in use. In the case of hand-line fishing salt clams are used for bait. For a 1,200 quintal fare of codfish 45 barrels of clams are taken, costing from $5 to $5.50 per barrel. For use in trawl-fishing, only a few barrels of clam bait are taken and a few tons of ice in which to preserve the fresh bait. When a vessel is provided in this manner she proceeds to Newfoundland, where a supply of fresh herring is procured at a cost of $1.50 to $2 per barrel. A full supply of ice is also laid in at this time, costing $2 a ton. Squid, which, between July 10 and August 1, sell for 20 to 75 cents a hundred or $5 a barrel, are also bought for bait. Cod roe, worth only $2 to $2.50 a barrel, is never saved. Tongues and sounds were formerly saved, when

the men fished on shares, they then being naturally willing and anxious to save them, but as the men are not at present so much personally interested in the voyage, some receiving stated wages, not many are saved. The livers are preserved in large vats until the vessel is within a short distance of home, when, the oil having been drawn off, they are thrown overboard. If the livers are fresh and but lately caught, they are brought into port and subjected to a steaming process. The average yield of oil is one-half gallon to a quintal of fish. When the fishing is carried on by means of trawls, each boat is provided with trawls armed with from 1,000 to 2,000 hooks, the average being about 1,200.

The present price of cod varies but little from that of forty years ago, when it was $2.75 to $3.50 per quintal. During 1879 the price was $3.25 to $3.50 per quintal. Forty years ago the business was profitable, while at present, with higher prices, it hardly pays expenses, and the trips often result in a loss on account of the present rate of wages and the cost of outfit, which are proportionately larger than is the advanced price of cod.

The record for 1879 shows that the active fishing fleet consisted of fifteen sail, aggregating 897.12 tons register, engaged in the cod fishery, ten of which went to the Grand Banks. One of the Bankers made two trips and another was lost on her second trip. No lives were lost during the year. One of the fleet made a trip to Banquereau.

On account of the poor encouragement which the fishermen have received in late years, five fishing vessels remained idle throughout the year 1879, while five others, with an aggregate tonnage of 601.97, were engaged for a part of the year only in coasting. These make up a total of twenty-five vessels of 1,499.09 tons.

The schooner D. A. Wilson made only one trip in 1879 to the Grand Banks, during which she took 1,700 quintals of fish and thereby cleared $1,000. For the past forty years or more, during which time trawl-fishing has come into general use, there has been no marked change either one way or the other in the abundance of cod. In trawling, five or six dories, with two men to a dory, are used. In hand-lining only one man goes in a dory, and eight to fourteen dories are used by a single vessel. Cod are usually taken in from 30 to 40 fathoms of water; in 5 to 20 fathoms only, on the Virgin Rocks.

SALEM.—Twenty years ago this port had a fleet of vessels engaged in fishing, and twenty-five sail went to George's and Grand Banks for cod. From 1860 to 1868 ten vessels engaged in the mackerel catch, besides numerous vessels which were engaged in the near-home shore fishing. A number of vessels were yearly built for fishing, and quite a large foreign demand was supplied from this port. The custom-house records of the early fishery business of this place are very imperfect and broken. Our principal information comes from the old dealers, but from them we can get no reliable statistics. At the present time the fishing industry is almost abandoned. The wharves along Derby street, once crowded with business connected with the fisheries, are now covered with lumber and coal, or else lie idle, wearing a deserted appearance. One wholesale firm alone remains. Only ten vessels have been built here in the past ten years, and none during the past two, in which time no fish have been exported.

During 1879 ten fishing licenses were granted to four vessels over and six under 20 tons each, the aggregate tonnage being 274.47. Of this number four were used only for fishing parties; one was engaged in the squid fishery off Newfoundland, supplying the fishermen with fresh bait; two went to the Gulf of Saint Lawrence for mackerel, one of which caught only 96 barrels throughout the entire season, the trip resulting in a loss; and three vessels fished near home.

The lobster fishery is followed by thirty men, using fifteen boats. They use 1,000 lobster pots and fish all the year from boats, weather permitting. The pots are all set single in and about the

ledges of the harbor and from 5 to 10 miles outside. Most of the catch is secured in April, May, September, and October; only a few are taken in warm weather. The catch of late years shows a general decrease, especially in the size of the lobsters. Small lobsters are reported plentiful, and are taken regardless of the State law referring to their length. Each boat, on an average, fishes with sixty pots, and makes a daily average catch of 150 lobsters during the season. The winter fishing averages 75 lobsters a day for each boat. The total catch in 1879 was 250,000. Most of the early catch is sold in Boston, while later in the season it is boiled in the old-fashioned kettle, and the greater part of it sold in the neighboring towns.

Concerning the oyster trade of Salem and vicinity, Mr. Ingersoll, in his census report on that industry, says:

"The oyster business here, the next place north of Boston where there is any original trade, seems quite out of proportion to the importance of the town. The reason is found in the fact that a large surrounding region derives its supplies from this point, as well as the town itself, which appears to be highly educated in the eating of all kinds of shellfish. Two schooners, the T. A. Newcomb, 130 tons, and the Lizzie Smith, 118 tons, are engaged in the trade. They cost $22,000, but now are worth only about $5,000 each. In the summer they go on mackereling voyages, but in the winter devote their whole time to bringing oysters from Virginia. Ten years ago 25,000 bushels sufficed for the demand, and a portion of these came from New York Bay; in 1875 three vessels were employed, and Salem called for 45,000 bushels, all from the Chesapeake. At present, however, the total annual importation by sailing craft does not exceed 40,000 bushels, with about 5,000 bushels by steamer from Norfolk, in winter, added. About 500 bushels of fancy stock from New York are also sold. A large portion of these oysters are sold at the wharf; another large portion goes into the storehouse; a third part are opened; and the remainder (8,000 to 9,000 bushels) are laid down in Collin's Bay, near Beverly Bar, where they are dry at each ebb-tide. No opened oysters are taken from Norfolk or Baltimore. The result is as follows:

	Amount.	Price.	Total cost.
	Bushels.		
Oysters imported in vessels	40,000	$0 36	$14,400
Oysters imported via Boston steamer	5,000	57	2,850
Oysters (fancy stock)	500	1 00	500
Totals	45,500	.....	17,750

"Selling price of Virginia oysters, imported at wharf, 40 cents; selling price of bedded oysters, in summer, 90 cents (common), $1.20 (selected); selling price of opened oysters (common), $1 per gallon; selling price of opened oysters (selected), $1.20 per gallon; selling price of opened oysters (in winter), 75 cents per gallon; annual amount of business, $40,000.

"The firms engaged employ forty-three men from November 1 to May 1; the rest of the year about twenty men. This represents about one hundred persons supported by the business, since many of the men are unmarried. The weekly salaries will average $12, and shuckers are paid 20 cents for each solid gallon.

"The old shells are disposed of to the gas company of the city at one-half cent a bushel, the purchaser paying for the carting. This does not take all of the 1,500 or so bushels a week accumulating, which are used by the proprietors to fill in water-lots, which they buy for the purpose of thus converting into land. To sell their shells is more profitable, however.

"The leading firm in Salem, Messrs. D. B. & J. Newcomb, boasts an economic method of transferring the cargo from the vessel to the shuckers' broad tables, ranged around the interior walls of their shucking-house down on the wharf. This building is two-storied, and is flush with the side of the wharf, so that the vessel moors alongside. A door in the end of the loft opens upon a rail-

less platform or balcony 6 feet square. Here two men stand to receive the loaded tubs of oysters as fast as they are hoisted (by horse-power) out of the vessel's hold. When a tub comes within reach they seize it, overturn it into a wheelbarrow, made of one-third of a strong cask, mounted on a wheelbarrow frame, and one man sends it down while the other goes and empties the barrow, returning in time to help when the tub comes up again. The ordinary method is for two men to receive the tub upon the first floor, carry it away, lift it up, and overturn it upon the table, while two others hand back an empty tub and repeat the operation. This requires four men and much lifting. The Newcombs, however, dispense with two men and all the laborious lifting, by receiving their oysters on the upper floor and dumping them from a wheelbarrow down shutes that lead to different portions of the shucking-table, or to the 'cool room,' where they can store 8,000 bushels at a time, if desired."

Statistical recapitulation of the oyster business of Salem and vicinity.

Number of wholesale dealers		3
Number of schooners engaged		2
Value of same		$10,000
Number of men hired by dealers		25
Semi-annual earnings of same		$2,500
Number of restaurant servants		20
Annual earnings of same		$12,000
Total number of families supported		25
Annual sales of—		
II. Chesapeake "plants"	bushels	40,000
Southern, by steamer	bushels	5,000
Value of same		$40,000
III. Fancy stock	bushels	500
Value of same		$750
Total value of oysters sold annually		$40,750

E.—THE DISTRICT OF MARBLEHEAD.

64. REVIEW OF THE DISTRICT.

PRESENT CONDITION OF THE FISHERIES.—Marblehead is well known as one of the most important fishing ports in the early history of Massachusetts. Its inhabitants are now chiefly dependent on manufactures. In this district are included the fisheries of Marblehead, Swampscott, Nahant, and Lynn. The fish industry of these places now employs five hundred and thirty-seven persons; the capital invested is $207,706, and the value of the product is $230,942.

STATISTICAL SUMMATION FOR 1879.—The following statement gives in detail the extent of the fishing interests of Marblehead district:

Summary statement of persons employed and capital invested.

Persons employed.	Number.	Capital invested.	Amount.
Number of vessel-fishermen	314	Capital in vessels and boats	$150,390
Number of boat-fishermen	193	Capital in nets and traps	12,316
Number of curers, packers, fitters, &c	30	Other fixed and circulating capital	45,000
Total	537	Total	a207,706

a Cash capital, $15,000; wharves, shorehouses, and fixtures, $30,000.

Detailed statement of capital invested in vessels, boats, nets, and traps.

Vessels and boats.	No.	Tonnage.	Value.	Value of gear, exclusive of boats and nets.	Value of outfit.	Total value.	Nets and traps.	No.	Value.
Vessels.							*Nets.*		
In food-fish fisheries:							Gill-nets:		
Active	39	1,057.52	$61,825	$12,060	39,560	$113,445	In vessel fisheries	38	$456
Idle	13	470.68	15,300			15,300	In boat fisheries	100	1,200
In lobster fishery	1	14.12	1,000	10	160	1,170	Purse-seines:		
Total	53	1,542.32	78,125	12,070	39,720	129,915	In vessel fisheries	15	8,400
Boats.							Total	153	10,056
In vessel fisheries	166		5,770			5,770	*Traps.*		
In shore fisheries	153		5,980	3,300	5,425	14,705	Lobster and eel pots	2,260	2,260
Total	319		11,750	3,300	5,425	20,475			

Detailed statement of the quantities and values of the products.

Products specified.	Pounds, fresh.	Pounds, prepared.	Bulk.	Value, prepared.
Grand total				$230,942
Fresh fish.				
Alewives	30,000			160
Cod	5,048,946			75,734
Cunners	15,000			75
Cusk	1,000			7
Eels	6,000			300
Flounders	1,000			15
Haddock	673,279			8,955
Hake	32,000			192
Herring	35,000			175
Mackerel	2,381,400			31,673
Pollock	25,000			100
Swordfish	17,000			510
Tautog	300			10
Mixed fish	226,000			1,130
Total	8,491,925			119,036
Dry fish.				
Cod	5,930,235	2,372,094		85,395
Cusk	26,356	13,178		356
Haddock	173,400	65,891		1,318
Hake	293,400	132,062		2,113
Pollock	192,800	79,069		1,344
Total	6,616,191	2,662,294		90,526
Pickled fish.				
Herring	40,000	32,000		480
Mackerel	81,000	54,000		1,552
Swordfish	7,000	4,000		130
Mixed fish	7,500	5,000		125
Total	135,500	95,000		2,287
Shell fish.				
Lobsters	325,500			11,935
Miscellaneous.				
Fish oil			7,510 gallons	4,283
Fish spawn			100 barrels	325
Fish sounds (dried)		2,500		2,250
Seaweed			300 tons	300
Total		2,500		7,158

65. THE FISHERIES OF MARBLEHEAD, SWAMPSCOTT, NAHANT, AND LYNN.

MARBLEHEAD.—From 1846 to the present time the fishery industry of Marblehead shows a steady decline. The system of giving bounties to fishing vessels, continued until 1867, failed to revive the interest formerly taken in this industry. This may be seen by an examination of the following table, giving the number of vessels and amount of bounty paid during the last few years of the existence of the bounty system:

Year—	Number of vessels.	Amount paid.
1862	61	$14,378 20
1863	52	11,595 95
1864	43	10,129 26
1865	43	9,336 06
1866	25	5,457 39
1867	20	4,927 37
Total		55,824 23

The bounty was at the rate of $4 a ton on the measurement of the vessel up to 90 tons, ceasing in 1866, since which time no bounty has been paid, the amount paid in 1867 being for fish caught in 1866.

In 1879 only one vessel was sent to the Grand Banks from this port. Seventeen vessels of small tonnage engaged in the home-shore fishery with ten sail idle, or occasionally engaged for sailing parties. A total of twenty-eight sail of 807.36 aggregate tonnage represents the fishing fleet of this once celebrated port. The fishing business of Marblehead has always been mostly cod, but few have engaged in the mackerel catch, and none to make a special business of it during the past twenty years. The old-established custom of the Grand Bankers was fishing on shares; the vessel receiving three-eighths, the captain, mate, and crew five-eighths; all bills for bait, stores, provisions, &c., being first paid. By the oldest living masters we are told that Marblehead vessels never fished in the Gulf of Saint Lawrence, nor for the past twenty years in any waters of the Provinces. In the prosperous days of the past a large number of vessels were built here, but, with the exception of a few yachts, none have been built for several years.

The appended statements show the extremely reduced condition of the fleet of vessels fishing on the Banks. Mr. Crittenden writes:

"Marblehead sends but one Banker this year (1879), fitted by George Knight. Less than forty years ago Marblehead sent seventy-five Bankers. There is considerable small-boat fishing. There are no large vessels engaged in the mackerel fishery."

Mr. Martin, of Marblehead, wrote to Professor Baird in 1879:

"Our fleet of vessels which several years since numbered from eighty to one hundred sail (engaged in the fisheries at the Grand Banks of Newfoundland) has been reduced to one vessel of about 80 tons burden."

It is sufficient to say of the fishery industry from 1877 to 1879 that there was nothing done, except by the shore boatmen. The larger vessels were tied to the wharf and the owners offered the use of them to the Gloucester men on condition that the latter pay the insurance, preferring that their vessels should be in use and taken care of than that they should lie idle at the wharf, depreciating in value every day.

The eighteen vessels which were engaged in fishing in the year 1879 were, with one exception, schooners ranging from 5 to 70 tons burden, with an average of 20 tons. They were all owned in Marblehead. The largest, the Oceana, 70.94 tons burden, was the only one engaged in the cod

fishery; the remainder were all shore fishing vessels, three of them, the Alabama, E. G. Williams, and Eliza, combining the mackerel fishery with shore fishing, and another, the Zeppie, the lobster fishery. The total capital dependent on the fisheries of Marblehead in 1879 was not more than $50,000, and the number of persons employed was one hundred and fifty. The product was valued at about $48,000.

Under date of February 20, 1882, Mr. Simeon Dodge, collector of customs at Marblehead, writes:

"The fishing business in this place increased from the year 1800 to 1846, and then gradually decreased until the present time. The loss of so many lives and vessels, the introduction of the shoe business, and, finally, the repeal of the bounty act, has reduced our fishing fleet to its present proportions. We now have in this district forty-three vessels engaged in the Bank and inshore fisheries, aggregating 1,164 tons."

Marblehead is one of the quaintest as well as one of the oldest towns in New England. It was once extensively engaged in the fisheries, but the people have of late years turned their attention to manufactures, and have allowed the fisheries to decline, until now there are but a very few vessels where formerly there was a fleet of a hundred or more sail. The people have become known as a sterling race, full of patriotism, and have always contributed their quota in time of national peril. About 1,000 Marbleheaders took active part in the Revolution, more than half of whom perished and left behind 600 widows and 1,000 fatherless children, in a population numbering less than 4,000. The famous frigate Constitution was chiefly manned during the war of 1812 by men from this town, and many privateers were sent out from here. At the close of that war nearly five hundred Marblehead men were held in England as prisoners of war.

SWAMPSCOTT.—This beautiful seaside town, situated 13 miles northeast of Boston, from its nearness to the fishing grounds and market, has long been and continues to be the home of a large number of fishermen. It has not, however, such a desirable harbor as have many neighboring ports in which the fishing industry is now almost entirely abandoned. The harbor, being open to the sea on the southeast, is quite exposed. The vessels do not anchor, but lie at moorings which are very heavy, weighing about 10 tons, and supplied with heavy chains. The risks in this sort of a harbor are so great that the vessels are never insured. No vessels, however, have been lost in ten years, except four, which were blown ashore in 1876.

Bordering the harbor are four sandy beaches, named Phillips, Whale, Blarney's, and King's. These are separated by ledges of rocks, the outcropping of the rocky bluffs, and are covered with fine residences. The fishermen own and occupy many of these houses, and for years may have been seen starting out morning after morning to engage in their daily labor, and they often, fishing within sight of home, return the same evening with from 8,000 to 12,000 pounds of fish. The two last-named beaches are the ones mostly used by the fishermen, who upon their arrival home make their vessels fast to heavy moorings from a quarter to a half mile from shore, and land their fish in dories, from which they are weighed off, loaded in wagons, and carried to Boston. This is done more or less at all seasons, but chiefly during the winter. At other times vessels go direct to Boston or other ports and sell their fish.

From 1830 to 1840 most of the fishing was carried on from the dories belonging to eight or ten small pinkey vessels. As the business prospered, larger and better vessels were built, until there was a fleet of 40 to 50 sail of handsome yacht-built schooners. Of late years, the fishing fleet has somewhat decreased. At present it numbers twenty-one sail of 682.48 aggregate tonnage, manned by one hundred and eighty-six American-born fishermen.

During 1878, fish were very plenty off this shore. Some vessels report taking as high as 16,000

pounds a day, codfish forming the largest part of the catch. For the past two seasons fish have been scarce on the old grounds. Vessels have been compelled on that account to go to the eastward and southward, and are away generally from four to six days on a trip. These trips have not been attended with the success of former years. During the summer season most of the vessels engage in the mackerel catch off the New England shore, supplying the Boston market with fresh fish. The small boat or dory fishermen, on account of being obliged to go out further, are introducing the lapstreak boat; this is usually schooner-rigged.

Most of the vessels are built at Salisbury, Mass., and measure from 50 to 60 tons, and often cost $10,000. They carry a crew of ten men, all, without exception, of American birth. The crew, including the captain, have an equal share in the proceeds. All expenses are charged to the gross stock, and one-fifth of the proceeds goes to the owners. The captain and some of the crew usually own a share in the vessel. The running expenses of a vessel are estimated by Capt. King Harding to be about $1,000 a year. To pay the crew for their time the vessel should stock $10,000. This is a fair stock. In 1877 and 1878 the average stock was below this amount. In 1876 and the ten previous years it exceeded it, in some years the "high-line" reaching $20,000.

The cod fishery is prosecuted from the middle of October until May, the mackerel fishery the remainder of the time. On an average, reckoning for twenty years past, the proceeds of the two have been about equal. For ten years previous to 1876, the mackerel interest predominated. In 1877 prices were poor. "The Nova Scotia imports have a ruinous effect."

But few lobsters are caught; thirteen men fishing with five hundred and twenty traps through part of the season. Their catch is consumed at and near home, a few being sent to Boston. At one time fishing vessels were built at this port, but none have been built here for the past fifteen years.

The fisheries of this place, in 1879, employed 320 men. The capital invested was about $50,000. The value of the product was about $140,000, and included 10,807 barrels of mackerel, over 5,000,000 pounds of cod, haddock, and cusk, 40,000 lobsters, and about 5,500 gallons of fish oil. Beside the 21 vessels, aggregating 682.48 tons, there were 21 lapstreak sail-boats and 80 dories used in the fisheries in that year.

LYNN.—The city of Lynn is largely interested in the manufacture of boots and shoes and other articles, and pays little attention to the fisheries. Four small vessels took out fishing licenses in 1879, but none of them followed the business. One was sold and the three others remained idle, except when engaged by pleasure parties for fishing. The only fishing done from Lynn during 1879 was by ten men fishing from dories near shore during part of the year and supplying the summer houses of Chelsea Beach with cunners, eels, and ground fish. At Flax Pond Brook in West Lynn about 100 barrels of alewives were taken during the year with dip-nets. About 50 barrels of alewives were caught by Lynn fishermen in the river in the adjacent town of Saugus.

F.—THE DISTRICT OF BOSTON.

66. REVIEW OF THE FISHING INTEREST OF BOSTON DISTRICT.

PRESENT CONDITION OF THE FISHERIES.—The fisheries in the district of Boston, which includes towns as far as Cohasset on the south shore of Massachusetts Bay, employ 92 sail of vessels and 472 boats, besides a large number of nets and other apparatus. Of the vessels, 73 are engaged in the capture of food-fish, one fishes exclusively for lobsters, four follow the menhaden

fishery, three the oyster fishery or carrying trade, and six the whale fishery. The tonnage of the fleet is 5,422.25 tons. In the shore fisheries for cod, haddock, herring, and other fish there are employed 188 boats and 426 men.

Boston, the principal place in the district, has a very large trade in fish, being one of the most important markets in New England and the center of the trade in imported fish. A large capital is invested here in buildings and wharves used in the fishery industry, and great quantities of fresh and cured fish are annually distributed from here, as will be seen from the paragraphs on Boston. The capital invested in the district is $3,218,949, and the value of the products, the catch of fishermen of this district, is $1,026,360. The number of persons employed is 2,653.

STATISTICAL SUMMATION FOR 1879.—The following statements show in detail the extent of the fishing interests of Boston district:

Summary statement of persons employed and capital invested.

Persons employed.	Number.	Capital invested.	Amount.
Number of vessel-fishermen	997	Capital in vessels and boats	$376,805
Number of boat-fishermen	426	Capital in nets and traps	38,944
Number of curers, packers, fitters, &c	1,024	Other fixed and circulating capital	a 2,803,200
Number of factory hands	206	Total	3,218,949
Total	2,653		

a Cash capital, $1,190,000; wharves, shorehouses, and fixtures, $1,388,200; factory buildings and apparatus, $225,000.

Detailed statement of capital invested in vessels, boats, nets, and traps.

Vessels and boats.	No.	Tonnage.	Value.	Value of gear, exclusive of boats and nets.	Value of outfit.	Total Value.	Nets and traps.	No.	Value.
Vessels.							*Nets.*		
In food-fish fishery:							Gill-nets:		
Active	73	3,430.94	$114,950	$14,015	$80,175	$209,140	In vessel fisheries	72	$954
Idle	5	462.30	14,500	.....	.....	14,500	In boat fisheries	200	2,400
In lobster fishery	1	5.77	50	10	160	220	Purse-seines:		
In menhaden fishery	4	292.75	31,500	300	1,200	33,000	In vessel fisheries	49	26,800
In oyster fishery	3	303.85	9,000	.....	300	9,300	Total	321	30,154
In whale fishery	6	926.64	34,000	.....	a 36,000	70,000	*Traps.*		
Total	92	5,422.25	204,000	14,325	117,835	336,160	Weirs, &c	1	500
Boats.							Lobster and eel pots	8,290	8,290
In vessel fisheries	284	.....	15,140	.....	.....	15,140	Total	8,291	8,790
In shore fisheries	188	.....	16,575	3,430	5,500	25,505			
Total	472	.....	31,715	3,430	5,500	40,645			

a Includes gear.

Detailed statement of the quantities and values of the products.

Products specified.	Pounds, fresh.	Pounds, prepared.	Bulk.	Value, prepared.
Grand total	.....	.....	.....	$1,026,360
Fresh fish.				
Alewives	192,800	.....	.....	1,328
Cod	5,482,825	.....	.....	82,242
Cunners	100,000	.....	.....	500
Cusk	313,304	.....	.....	2,193
Eels	5,000	.....	.....	250

Detailed statement of the quantities and values of the products—Continued.

Products specified.	Pounds, fresh.	Pounds, prepared.	Bulk.	Value, prepared.
Fresh fish—Continued.				
Flounders	45,000			$675
Haddock	8,459,217			112,508
Hake	783,260			4,700
Halibut	260,000			9,100
Herring	1,163,150			5,816
Mackerel	2,206,421			29,345
Menhaden	221,400			332
Pollock	626,611			2,506
Shad	128			6
Smelts	6,000			150
Swordfish	15,750			472
Mixed fish	829,000			4,145
Total	20,709,866			256,268
Dry fish.				
Cod	1,462,500	585,000		21,060
Cusk	6,500	3,250		88
Haddock	42,700	16,250		325
Hake	280,000	126,000		2,016
Pollock	47,500	19,500		332
Total	1,839,200	750,000		a 104,000 23,821
Pickled fish.				
Alewives	31,250	25,000		500
Bluefish	5,362	3,300		82
Cod	61,000	30,500		762
Herring	877,656	702,125		10,532
Mackerel	6,569,700	4,379,800		125,919
Swordfish	38,500	22,000		715
Mixed fish	15,000	10,000		250
Halibut fins	7,875	6,300		252
Tongues and sounds	50,000	40,000		1,500
Total	7,656,343	5,219,025		140,512
Canned fish. b				
Clam chowder		36,000	36,000 cans	7,500
Fish balls		264,000	264,000 cans	38,500
Fish chowder		36,000	36,000 cans	7,500
Smelts		38,400	38,400 cans	4,800
Total		374,400	374,400 cans	58,300
Shell fish.				
Lobsters	1,390,800			50,996
Oysters			15,400 bushels	c 325,625 15,000
Clams, for food			34,940 bushels	17,470
Total				409,091
Miscellaneous.				
Fish oil			20,000 gallons	8,000
Fish guano			1,000 tons	6,000
Fish spawn			300 barrels	975
Fish sounds (dried)		2,200		1,980
Irish moss		45,000		1,575
Seaweed			400 tons	400
Products of whale-fishery—sperm oil			10,270 gallons	15,438
Total				34,368

a Enhancement on dried fish prepared as "boneless" in Boston, but accounted for elsewhere.
b Exclusive of salt mackerel canned in Boston.
c Enhancement on southern oysters.

67. BOSTON AND ITS FISHERY INDUSTRIES.

GENERAL DESCRIPTION OF THE CITY AND ITS FISHING BUSINESS.—Boston is the largest city in New England in regard to commerce as well as in population. It also has the finest harbor of New England, and its shipping business, together with its foreign and domestic trade, is very extensive. It is a great railroad center, being the terminus of all the principal lines in New England. It has several historical landmarks, as the Old State House, Old South Church, Faneuil Hall, Bunker Hill, and Dorchester Heights. It was settled in 1631, and was called Shawmut by the Indians. The settlers called it Trimountain, because of its three hills. It received its present name as a token of respect to the Rev. John Cotton, a minister of Boston in England, and afterwards minister of the first church here. The population in 1790 was 18,038; in 1870, 250,526; and in 1880 it had increased to 362,839, making it the fifth city in the country in respect to population.

From the early colonial days to the present time, Boston, although never having a large fishing fleet in comparison with Gloucester, Marblehead, and other New England ports, has been recognized in the fish trade as a central receiving and distributing port for all points, both domestic and foreign. Many vessels from the other New England fishing ports, as well as from the Provinces, bring their catch direct from the fishing grounds to this port for a market, or, returning to their home port to land and cure, their cargoes are finally brought here.

According to Sabine (Report on American Fisheries, 1852), Boston had vessels fishing on the Newfoundland Banks as early as 1645. The first exportation of fish from Boston was in 1633. The adventure was to one of the southern colonies, and Governor Winthrop appears to have been interested in it. The vessel, which was laden with furs as well as the products of the sea, was wrecked on the outward passage when near the capes of Virginia.

The fishing business, which has undergone many changes within the past generation, may at present be divided into two distinct classes, the fresh and the salt or cured fish trades, of nearly equal capital. The latter branch is no larger than it was ten or twenty years ago, and has not advanced with the country and other industries. The fresh-fish trade has steadily increased, the total business showing that as much fish are caught and consumed at the present time as in the past, when the foreign and domestic shipments of salt fish were much greater.

The fishing fleet belonging to Boston in 1879 numbered 76 vessels, aggregating 4,467.87 tons, and valued at $165,300, exclusive of their gear and outfit. The total value of the fleet, including the value of gear and outfit, such as boats, nets, seines, salt, ice, and provisions, was $312,974, and the total number of men in the crews was 868. Of the total fleet, 5 vessels, measuring 462.30 tons and valued at $14,500, were idle throughout the year; 60 vessels, measuring 2,780.41 tons, were employed in the food-fish fisheries; 1 small vessel, of 5.77 tons burden, engaged exclusively in the lobster fishery; 4 steamers, measuring 292.75 tons, followed the menhaden fishery; and 6 vessels, of 926.64 tons burden, were employed in the sperm-whale fishery.

The sixty vessels engaged in catching food-fish made trips lasting only a few days, fishing near home, and usually returning with fares of fresh fish. About one-third of these vessels followed the mackerel fishery from April till November, bringing their fares in fresh or curing them on board.

No Boston vessels are engaged in the George's or Grand and Western Banks salt-cod fisheries, but the supply of fish from these banks for the Boston market comes from other New England ports and from the Provinces. The whaling vessels in 1879 landed 18,270 gallons of sperm oil, valued at $15,438. In addition to the fleet of fishing vessels, there were one hundred and nineteen sail-boats and row-boats, valued, with their outfits, at about $20,000, that fished in and about Boston Harbor. These boats gave employment to three hundred and thirty-five men. Their catch included all

the food species of shore fish, lobsters, and clams. During the latter part of September and the first of October they take large numbers of shore-herring, and in the winter, quantities of haddock. In 1879 forty-five of the larger size boats took 1,990,062 herring in number, and 3,250,000 pounds of other fish.

Comparing Boston as a fish market with its importance as a fish-producing center, we find that the aggregate value of fish and fish products annually received and distributed by the fish dealers is over $5,000,000, exclusive of $700,000 worth of oysters, while the value of the catch by the fishermen and fishing vessels of Boston is about $1,000,000. The total capital invested in the various branches of the fishing industry in Boston and the neighboring towns included in the same customs district is $3,218,949. This amount includes $1,388,200, the value of wharves, storehouses, and fixtures; $225,000, the value of factories for the preparation of canned and boneless fish; and $1,190,000 additional cash capital. If to the total capital as above be added the investment in related industries, such as the net business, the oil-clothing business, and isinglass factories, the aggregate capital dependent on the fishing industry would reach a much larger figure.

The total number of men directly employed in the fishing industries is about 2,500, to which number may be added several hundred who are engaged in the manufacture of nets, barrels, boxes, and other articles used in the fisheries.

THE TRADE IN DRY AND PICKLED FISH.—Previous to the year 1815 not a single firm in Boston was engaged exclusively in the sale of dry and pickled fish, this business all being carried on by the wholesale grocers, who bought the cured fish direct from the vessels and disposed of them mostly to the New England trade. The first wholesale fish store in Boston for the purchase and sale of dry and pickled fish was opened on Long wharf in 1815 by Mr. Ebenezer Nickerson, and for fifteen years he was the only exclusive salt-fish dealer. In 1830, two other firms engaged in this branch of the fishing industry, and as it steadily grew in importance other firms started, until at the present time there are sixteen wholesale dealers in dry and pickled fish. Of the extent of the business in those early days we have no record, except the custom-house record of exports and the meager report of the State inspector. The fishermen themselves, with very few exceptions, to the present day, keep no account of their business, even from one trip to another. An exceptional good year's business is remembered and handed down as a tradition from year to year. Through the enterprise of the late Mr. Franklin Snow (a dealer for over twenty-five years), the Boston Fish Bureau was organized in 1875. It is an association of the salt-fish dealers for a bureau of information and statistics. Since its organization the records are more complete than ever before. We are indebted to it for tables of the receipts from foreign and domestic ports for the past few years.

In the early history of the business it was not only confined mainly to New England trade, but to the crude article. The dry fish were tied up in bundles, with or without mats or other covering, and pickled fish were packed in barrels and smaller cooperage packages. At the present time fish are taken from the vessels into the large packing and manufacturing establishments, where they are sorted and rapidly transformed into packages of "boneless," "minced fish," "fish-balls," and various other specialties. They are put up in boxes of all sizes from 1 to 500 pounds, or are packed in tin cases of different sizes, neatly labeled and boxed, and, with the larger packages of whole, half, quarter barrels and kits, are loaded into cars at the door to be shipped to all parts of the country. This improvement over the old manner of doing business has resulted in a much wider field and increased trade, and Boston-packed preparations of fish are now found in nearly all the grocery stores from the Atlantic to the Pacific. New England caught fish are noticed in the daily market reports of San Francisco and Oregon as much as at home, and command a

higher price than the catch of the Pacific. Not the least among the desirable results secured by the improved methods of packing is the clean and attractive appearance of the packages as compared with the former loose mode of shipping.

Boneless fish is dry cod, hake, cusk, or haddock, from which the skin and bones have been removed. The stripped fish is then cut up into small or large pieces, and packed in various-sized boxes. Simple as this process is, and always in use since fish have been used for food, it has been protected by patents issued in 1868 and 1869, causing an endless amount of trouble among the manufacturers, a royalty fee being charged.

During the past five years this mode of placing fish on the market shows a large annual increase. Boneless fish is packed mostly in small wooden boxes of convenient sizes, holding from 5 to 40 pounds, though a small amount is put up in paper boxes of 3 to 5 pounds each. This excellent article has become very popular with all classes. Codfish commands the highest price, while cusk, haddock, and hake follow as to value. During the year 1879 the aggregate amount of fish of all kinds cut up as boneless amounted to 6,502,050 pounds. The loss or shrinkage in weight is from 20 to 28 per cent. on cod and cusk, and about 30 per cent. on hake, which leaves the aggregate net amount of prepared fish 5,201,640 pounds. The industry gives employment to one hundred and fifty men during the active season, or an average of eighty men during the entire year.

In the infancy of the business the waste was more than a dead loss, being an incumbrance and additional expense for removal, and was gladly given away to any one who would remove it. As soon as its fertilizing qualities became known a demand sprang up, and from 50 cents to $1 a ton was paid for it. The price advanced from time to time, as the demand increased, until, in 1879, $6 a ton was paid for fish skins and bones for the manufacture of guano and fish-glue.

The sixteen firms at present engaged in handling dry and pickled fish and oil occupy the whole or part of nineteen wharves in East Boston and the city proper. The amount of capital invested in this branch of the fishing business, including the value of the wharves, is about $1,500,000, and the number of hands employed is three hundred and seventy-nine. During 1879 the amount of dry fish received in Boston was 201,963 quintals of cod, haddock, hake, pollock, and cusk, about one-sixth of which came from the Provinces, and the balance from fishing ports in Maine and Massachusetts. The receipts in 1880 were 221,103 quintals of the same varieties of fish, and in 1881 the amount was increased to 244,967 quintals.

The same firms that deal in dry and pickled fish also sell smoked herring and bloaters, that are received from Eastport and other parts of Maine and the Provinces. The total receipts of these fish in 1879 were 460,349 boxes of herring and 23,077 boxes of bloaters. In 1880 the amount was 443,597 boxes of herring and 20,603 boxes of bloaters. The receipts in 1881 reached 612,412 boxes of herring and 30,429 boxes of bloaters.

The trade in pickled fish is extensive, and includes mackerel, herring, alewives, salmon, salmon-trout, and shad, received from New England fishing ports and from the Provinces. About half of the total receipts of mackerel are from the Provinces, as is also the case with the receipts of herring, while alewives, salmon, salmon-trout, and shad come chiefly from the Provinces. The total amount of pickled fish received by Boston dealers in 1879 included 167,444 barrels of mackerel, 56,844 barrels of herring, 6,522 barrels of alewives, 6,013 barrels of salmon, 1,437 barrels of salmon-trout, and 3,042 barrels of shad. In 1880 the amount received included 196,493 barrels of mackerel, 55,802 barrels of herring, 7,033 barrels of alewives, 2,892 barrels of salmon, 698 barrels of salmon-trout, and 1,975 barrels of shad. Of the total receipts of mackerel in 1879, 15,275 barrels were taken by Boston vessels, 34,138 barrels were landed in Boston by mackerel vessels belonging to other New

England ports, 33,818 barrels came by freight to Boston from domestic ports, and 84,213 barrels from the Provinces.

The total quantities of dry, pickled, and smoked fish received by the Boston fish dealers during the years 1876 to 1881 is shown in the following table, compiled from the annual reports of the Boston Fish Bureau. None of these fish, with the exception of part of the mackerel, are taken by Boston vessels, but are received from other fishing ports of New England, or from the Provinces, by steamer, rail, or coasting vessels, and are sold in Boston or distributed over the country, either in the same condition as received, or otherwise prepared for use. The total value of these fish received in 1879 is estimated at $3,842,043. The Boston mackerel fleet includes vessels owned in Boston, and also several belonging to Cape Cod and other places, but that pack their catch in Boston.

The following table shows the receipts of pickled, smoked, and dry fish, by Boston fish dealers, from 1876 to 1881:

Kinds.	1876.			1877.			1878.		
	Domestic receipts.	Foreign receipts.	Total.	Domestic receipts.	Foreign receipts.	Total.	Domestic receipts.	Foreign receipts.	Total.
Pickled fish.									
Mackerel ..... barrels	82,935	43,612	162,931	35,529	86,356	142,344	31,881	78,689	143,028
Mackerel, Boston fleet ..... do	36,384	.....		20,459	.....		32,458	.....	
Herring ..... do	17,609	76,251	93,860	19,851	58,097	77,948	22,810	42,300	65,110
Alewives ..... do	910	6,263	7,173	2,026	1,252	3,878	4,014	3,117	7,131
Salmon ..... do	.....	2,720	2,720	.....	5,686	5,686	.....	3,906	3,906
Trout ..... do	.....	159	159	.....	834	834	.....	203	203
Shad ..... do	11	541	552	.....	893	893	.....	1,192	1,192
Smoked fish.									
Herring ..... boxes	266,906	65,180	332,086	282,062	180,931	462,993	214,715	171,508	386,223
Bloaters ..... do	10,824	.....	10,824	18,495	.....	18,495	17,629	.....	17,629
Dry fish.									
Cod ..... quintals	111,690	7,818	119,508	126,140	20,509	146,649	174,624	9,034	183,658
Hake ..... do	16,504	1,118	17,622	30,149	14,723	44,872	45,700	10,973	56,673
Haddock ..... do	3,021	1,240	4,261	4,916	6,309	11,225	9,683	1,680	11,363
Pollock ..... do	1,288	2,267	3,555	4,241	3,363	7,604	2,601	2,247	4,848
Cusk ..... do	2,471	.....	2,471	2,291	330	2,621	2,917	.....	2,917
Boneless fish ..... boxes	7,029	.....	7,029	7,138	.....	7,138	3,015	.....	3,015

Kinds.	1879.			1880.			1881.		
	Domestic receipts.	Foreign receipts.	Total.	Domestic receipts.	Foreign receipts.	Total.	Domestic receipts.	Foreign receipts.	Total.
Pickled fish.									
Mackerel ..... barrels	33,818	84,213	167,444	36,761	105,730	196,493	73,653	61,850	204,929
Mackerel, Boston fleet ..... do	49,413	.....		54,002	.....		69,669	.....	
Herring ..... do	26,146	30,698	56,844	26,492	29,310	55,802	12,420	44,906	56,998
Alewives ..... do	795	5,727	6,522	1,351	5,682	7,033	2,184	8,104	10,288
Salmon ..... do	145	5,868	6,013	560	2,332	2,892	980	1,997	2,977
Trout ..... do	.....	1,437	1,437	.....	698	698	.....	1,147	1,147
Shad ..... do	.....	3,042	3,042	.....	1,975	1,975	.....	1,152	1,152
Smoked fish.									
Herring ..... boxes	291,473	168,876	460,349	262,482	118,115	443,597	337,830	274,592	612,412
Bloaters ..... do	23,077	.....	23,077	20,603	.....	20,603	29,619	810	30,429
Dry fish.									
Cod ..... quintals	128,912	21,989	150,901	124,338	30,151	163,489	125,450	56,852	182,302
Hake ..... do	27,069	6,610	33,679	32,222	8,810	41,032	41,021	7,901	48,922
Haddock ..... do	9,155	922	10,077	9,172	976	10,148	5,792	1,631	7,423
Pollock ..... do	1,598	3,437	5,035	1,523	2,762	4,285	1,773	3,020	4,793
Cusk ..... do	2,059	212	2,271	1,362	187	1,549	1,469	38	1,507
Boneless fish ..... boxes	5,915	.....	5,915	9,646	54	9,700	14,293	316	14,606

THE FRESH-FISH BUSINESS.—From the first settlement of Boston until the year 1835 the fresh-fish business was carried on only as a retail trade. Ice was not then used, so that in the summer season but limited quantities of fish could be sold, and then only to the near towns. During the winter, fresh fish were teamed inland as far as Albany and Montreal. The catch came from Massachusetts Bay and was supplied by the small fishing vessels from this and neighboring ports. During cold weather it was brought in a frozen condition by teams from Cape Ann and other ports. The oyster business was of small importance, and was carried on from two hulks covered in and used for storage below and stores above. The oysters came mostly from Cape Cod, never from south of New York, and were not sold during the months of July and August.

As the demand for fresh fish increased, better facilities were needed to handle the catch. The first wholesale fresh-fish store was opened on Long Wharf in 1835, by Holbrook, Smith & Co. Their business in fresh fish was mostly during the winter and spring months, and through the warm weather their trade was confined to pickled, dry, or smoked fish. In 1838 this firm removed to Commercial Wharf, being the first fresh-fish firm on that wharf, which, at the present time, is the headquarters of the trade. There are now thirty-five firms on and near Commercial Wharf engaged in the wholesale fresh-fish business, and five retail dealers holding stalls in Faneuil Hall Market, receive large quantities of fish, especially fresh-water and rare species, from first hands. The capital employed in this trade, including the value of wharves and buildings, is about $1,000,000, and the number of hands employed is two hundred and seventy-five.

The total value of fresh fish received in Boston from all sources during the year 1879 was valued at $1,761,259, and included the following species:

Species.		Quantities.	Species.		Quantities.
Alewives	pounds	1,308,234	Salmon	pounds	1,351,995
Bluefish	do	1,616,735	Salmon trout	do	7,500
Brook-trout	do	6,900	Scup	do	17,500
Cod	do	11,013,915	Shad	number	257,097
Cunners	dozen	38,000	Sheepshead	pounds	4,850
Cusk	pounds	956,747	Smelts	do	696,161
Eels	do	258,664	Spanish mackerel	do	15,865
Flounders	do	289,105	Striped bass and seabass	do	118,951
Haddock	do	17,447,962	Sturgeon	do	4,000
Hake	do	1,658,176	Swordfish	do	863,154
Halibut	do	3,659,285	Tautog	do	38,887
Herring	number	11,799,968	Whitefish	do	25,004
Lake pike	pounds	6,250	Yellow perch	do	16,500
Mackerel	number	11,724,943	Crabs, soft	dozen	5,000
Pickerel	pounds	144,075	Scallops	gallons	2,000
Plaice	do	26,712	Shrimp	do	200
Pollock	do	1,360,115	Terrapin	number	2,000
Red snappers	do	12,200			

About one hundred Boston vessels and large boats, and an equal number belonging to other New England ports, landed fares of fresh fish in Boston during 1879. The Boston vessels landed 1,599 fares or 15,558,000 pounds of cod, haddock, hake, cusk, flounders, and swordfish; 30 fares or 1,749,693 fresh mackerel in number, and 120 fares or 1,998,062 herring in number. The fleet belonging elsewhere landed 1,171 fares or 17,531,174 pounds of cod, haddock, swordfish, and other ground fish; 220 fares or 9,975,250 fresh mackerel in number; 18 fares or 548,892 pounds of fresh halibut, and 30 fares or 1,935,270 shore herring in number. Besides the above quantities of fresh fish landed by fishing vessels, there was a large amount received by rail, steamers, and sailing vessels, including 500,000 pounds cod, haddock, and other ground fish, 3,110,393 pounds of halibut,

1,351,995 pounds of salmon, and 232,229 pounds of fresh-water fish; also 7,866,636 frozen herring in number received from the Provinces.

The Boston vessels are manned by men of all nationalities, but those of Irish birth or descent appear to be the largest element in the market fishery. The men generally fish on shares, the owners of the vessel being entitled to one-fifth of the gross receipts, and the men dividing equally, after the cost of stores, tackle, bait, ice, and some other incidentals is deducted. The cook has an equal share with the fishermen. The vessel owners find boats and dories.

Codfish and nearly all species of ground fish are taken on trawls armed with from 500 to 1,500 hooks each, according to the depth at which they are to be used. The main line or ground line of the trawl averages about an inch in circumference, and is coiled in a tub or half-barrel, with the hooks arranged around the edge. From one to four tubs of trawl are carried by each dory, which may be manned by one or two fishermen. Having previously baited their hooks, the men row away from the vessel and set their trawls around her at a convenient distance, usually within hail. In shallow water the trawls are constantly underrun; the fisherman hauls in the fish caught and rebaits the hooks; but in deep water the trawls are generally visited and run only two or three times a day, owing to the great depth of water and the hard labor required to take care of so great a number of hooks and length of line. Codfish are taken in the spring by the market-boats in Ipswich Bay and on the Middle Bank, and by the Gloucester vessels on La Have and Brown's Banks, and after February 1 on George's Banks. During the summer and early fall the larger part of the supply comes from the South Channel and Middle Bank and all along the back of Cape Cod, and from November 1 to January 1 all the way from Swampscott to Ipswich Bay, wherever a ledge fit for the spawning fish presents itself. The total amount of fresh codfish received during 1879 was 11,013,915 pounds.

The amount of fresh haddock received during 1879 was 17,447,962 pounds, by far the largest amount of any single species. It is a favorite fish and is preferred by many to cod or other species of ground fish. It seems hardly possible that not many years ago this fish was thought of little or no value; none were cured, and only occasionally would a person use them fresh. The fisherman on George's Banks or elsewhere, fishing for cod, on being so unfortunate as to find only a haddock on his line, with a growl and a kick would send it back into the sea. Now these fish are sought after on George's Banks as well as on other cod-fishing grounds. They are taken in the same manner as cod on trawl or hand lines, and usually bring about the same price as cod.

Hake and cusk are found in deep water on muddy bottom, around the ledges and banks frequented by cod, and are taken by the same gear, bait, and equipments.

Halibut stands third in the aggregate number of pounds of fresh fish received, but leading all other single species in the value of the catch. They are taken for the fresh fish market on the borders of nearly all the banks. Many were formerly taken in shallow water, and some were gaffed as they followed those hooked to the surface, but the larger portion are now caught in from 100 to 250 and even 300 fathoms, on the edges of the banks. It is still related that when the first schooners fished on George's they did not anchor, but drifted across the shallows, taking several with the gaff for every one hooked, and a similar experience was met by the first vessel sent to Greenland, her crew having gaffed nearly 500 halibut in one day.

Swordfish are taken off the New England coast in considerable quantities, and during the year 1879 there were 863,154 pounds marketed in Boston. They are brought to market mostly by New Bedford and eastern vessels, and are captured with spears or lances.

Salmon are sent to this market from April to August, the earliest coming from the Kennebec and Penobscot, and the latest from the Labrador coast via Quebec and Montreal or the Inter-

colonial Railway. They are packed in large wooden boxes holding from 200 to 300 pounds, and during the last part of the season are frozen in large numbers for preservation until the next season's catch is obtained. Nearly all are taken by gill-nets, as the Canadian law forbids the capture of salmon in weirs and pounds, although the law is far from being strictly complied with. The amount usually received here is large, often in excess of the demand, at prices that are not remunerative to the shippers.

Bluefish, once almost unknown in this market, are sent here in large numbers. Their first appearance in Boston Bay in this century was in the year 1837, when the fishermen, finding themselves forced to fish in dories among the rocks for mackerel, "scow-banking" as it was called, discovered that the blue-fish invasion had drawn the mackerel to the shelter of the rocks and ledges. This fish is taken by hand-lines from Ipswich Bay to Sandy Hook, but principally in weirs on both sides of Cape Cod and along the coast of Rhode Island and Connecticut. Like the salmon it is preserved by being frozen, and can be procured the year round.

Bass are not a plentiful fish in this region, but some are shipped here from New Market, N. H., from either shore of Cape Cod, and from points south. They were formerly taken in great abundance along the shores of the old Plymouth colony and Cape Cod, principally by means of small seines, thrown from boats and hauled ashore.

Shad are supplied to the Boston market from almost every river and shore from the Potomac to the Saint Lawrence, some of the finest coming from the Bay of Fundy and Saint John River.

Flounders are caught by the smallest boats of the market-fishermen. They are little valued, and are chiefly sold to the poorer and foreign class; but the aggregate catch is quite large.

Eels are mainly supplied from various parts of Boston Harbor, and are chiefly taken in pots baited with broken clams, or chopped-up fish heads. When ascending the rivers and small streams in the fall, or leaving them in the early spring, large quantities are sometimes taken by obstructing the flow of water, and placing in the center of the stream a strong barrel pierced with auger holes, into which the eels creep, but out of which, curiously enough, they seem unwilling to stir. The barrels have been so filled at times as to suffocate a large part of the catch before morning. Very large and fat eels are sent here in winter from certain towns in Maine, as well as from various other points, but the eel is not valued as in Europe, and the market is easily overstocked.

Smelts are brought from Maine, Nova Scotia, and New Brunswick, where, during the winter months, they are seined under the ice in large quantities. The Massachusetts law forbids the seining of them, and but a small part of the market supply is of home catch. Over half a million pounds of eastern smelts come to this market yearly, and retail from 3 to 6 cents a pound. They often sell, in quantities, from 1 to 1½ cents per pound, and afford a cheap food-fish to the poorer classes, though these frozen smelts seldom retain the peculiar and delicate flavor of the recently caught fish. During the past winter, for the first time, quite a large amount were canned, being cooked in butter. They met with a ready sale, and a large business will probably be done in that line hereafter.

Previous to 1817 mackerel were caught with hook and line when under sail, or, as it was called, "drailing." Vessels usually carried twelve men, six being stationed on each side, and each man tended a pole from which three lines with hooks were suspended. The pole was made fast to the side of the vessel. This way of fishing always required a good breeze, and if the breeze died away no fish could be caught, although the vessel might be surrounded with them. In 1817, according to Rev. Elisha Kellogg, of Harpswell, Me., Captain Pote, of Freeport, Me., observed that the hake fishermen, by throwing the refuse overboard, called the mackerel around. From this hint he began chopping up mackerel with a hatchet and throwing it over to attract the fish to the side of the

vessel. The watch on deck at night chopped the bait, but only the captain threw it, and with so much economy that an iron spoon was used for that purpose. Captain Pote was very successful, and, keeping his method a secret for a long time, other fishermen said he had made a bargain with the evil one. From that time it is claimed that the practice of throwing bait and using the hand-line began. Mackerel are now taken by the market fishermen and American fleet almost exclusively with the purse-seine in deep water, and many are brought fresh to market from as far south as Cape Henry in the spring, and later in the season from off the New England coast, and as far north and east as Halifax in July and August. They are caught in weirs and gill-nets off Cape Cod early in the spring and late in the fall, and by the hand-line of the shore-fisherman among the ledges all along the Massachusetts coast. During the past season they have varied in size, and ranged in value from 25 cents to $25 per hundred. During the year 1879 there were received in Boston 11,724,943 fresh mackerel in number.

Herring are principally sold fresh in winter, when the supply comes from the shores and islands of Eastern Maine and New Brunswick, where vessels fish all winter. The fall catch off the home coast in October and November freely supplies the market at that season, but the herring is not then highly valued as a fresh-fish food.

Alewives are sent here to a small extent in spring from the small rivers and inlets of this State, Rhode Island, and Connecticut, but most of them go to the smoke-house or are pickled for the West India trade.

Turtle and terrapin are not largely sold in this market. The former comes from the West Indies and South America, and the latter from Virginia, both of them chiefly via New York.

Tautog are caught in weirs and also with the hand-line, and are chiefly taken around Cape Cod. They are highly esteemed, but seem to be much less numerous than a generation ago.

Plaice are mostly caught off Cape Cod with the hand-line, with small but stout hooks.

Spanish mackerel are taken from the south shore of Cape Cod to New Jersey, but are counted a southern fish, and most of the 16,000 pounds annually received in Boston are taken along the southern coast.

Sturgeon, so largely handled in the Philadelphia and New York markets, are not much sought after here; but a few thousand pounds have been sold here for the past three years.

Red snappers are ordered by a few dealers from New York. More are seen in this market now than formerly, from 5,000 to 10,000 pounds a year being sold.

Sheepshead are even less called for than the red snapper, and are only occasionally received from the New York dealers.

Scup are taken principally along the south coast of Massachusetts, Rhode Island, and Connecticut. They are no longer as plentiful or as large as formerly, and during the past season have been smaller and scarcer than for many years.

Striped bass is another excellent fish. Once large and plenty, they are now small and scarce in the rivers of New England, and thus far the Canadian fish are seldom sent to the Boston market. Less than the amount once annually taken at a single one of the many estuaries frequented by these fish, appeared in the Boston market last year.

Salmon trout are received from Maine and the Dominion, and are sold here annually to the amount of 4 or 5 tons. The trout business is crippled by the harshness of protection laws, which refuse the dealers the privilege of importation during our close season, at which time the trout of more northern waters are in their best condition.

Sea perch, or cunners, were taken in much larger quantities a few years ago than at present; 38,000 dozen were sold in Boston during 1879. The market could dispose of many times this

amount if they were taken, but for some unexplained cause the supply has largely decreased during the past few years.

A few pompano, bonito, shrimps, soft-shell crabs, English prawns, and other species prized by epicures, are found in this market, but the aggregate quantity is small. The bulk of the fresh-fish business is in ground fish, salmon, halibut, lobsters, and clams. Salmon, shad, bluefish, mackerel, and any species that are taken only at certain seasons of the year, can be had at any time in the frozen state. During the season when they are plenty they are spread out in huge refrigerators, charged with ice and salt, and frozen solid. They are then piled like billets of wood in other large refrigerators, where a temperature of about 10° above zero is maintained. They are taken from the refrigerators as wanted, being found frozen solid even during the warmest weather. The demand for frozen fish is not large, and only one firm pays much attention to freezing them. Dealers claim that the demand for fish that are out of season is too small to justify a great expenditure of time or money in freezing them.

Soon after being landed, fresh fish are packed in boxes holding an average weight of 425 pounds, with from 40 to 50 pounds of crushed ice packed with them. They are also packed in old flour barrels, holding from 200 to 225 pounds of fish, with 20 to 25 pounds of ice, the barrels being covered with tea-chest matting or sacking. They are then shipped to any part of the country, Chicago and Saint Louis being the practical western limit of destination. Dealers state that one-half of the total amount is consumed in New England, one-fifth in New York City and State, while Philadelphia, Baltimore, and Washington, with the Middle and Western States, consume the remaining three-tenths. New England orders are mostly shipped in barrels, while the large boxes are sent to the leading cities.

THE TRADE IN CANNED FISH.—During the past few years an extensive business has grown up in canned fish. Fish-balls, chowders, and uncooked mackerel packed in tin have found a ready market, and large quantities have been packed in Boston. No lobsters or clams are canned in Massachusetts, but that industry is centered on the coast of Maine, especially in the vicinity of Penobscot Bay. It is estimated that some 2,112,000 1-pound cans of lobsters were packed on that coast in 1879. Large as this amount appears, it is a fact that in years past an equal quantity has been packed at individual ports, but owing to the present scarcity of lobsters several of the large companies controlled by Boston and Portland capital are now obliged to open establishments in Nova Scotia, Cape Breton, and other parts of the Provinces.

During the year 1879, Boston firms packed in their factories in Boston and elsewhere, and distributed from Boston, 9,649 cases or 463,152 cans of lobsters, valued at $57,894; 8,400 cases or 403,200 cans of salt mackerel, valued at $33,600; 20,000 cases or 240,000 cans of fresh mackerel, valued at $90,000; 800 cases or 38,400 cans of smelts, valued at $4,800; 1,500 cases or 36,000 cans of fish-chowder, valued at $7,500; 11,000 cases or 264,000 cans of fish-balls, valued at $38,500; and 1,500 cases or 36,000 cans of clam-chowder, valued at $7,500. A large proportion of the products of the canneries controlled by Boston capital is distributed direct from the Eastern factories and does not appear in this report.

The duty on tin cans from the Provincial factories is so heavy as to practically shut them out of this market. A large part of the product of these factories passes through the United States in bond to the European markets. The products of the canneries are distributed all over the country, but principally west and south. There is also a large European trade in canned lobsters and a moderate demand for other fish productions in tin.

Of the various specialties, fish-balls is the only one that is protected by a patent, a Boston fish packer and dealer having obtained a patent for that article in March, 1878. They are com-

posed of nearly equal parts of choice codfish and potatoes. The fish are uncooked or parboiled, and the potatoes are washed, boiled, and pared, with the greatest attention to quality, cleanliness, and perfect cookery. The ingredients are then chopped as fine as possible by machinery, and at the same time are intimately mixed. The mixture is then put up in cans of 1, 2, or 3 pounds each, and subjected to a steam bath. They are then hermetically sealed, and are warranted to keep in any climate.

Canned salt mackerel is an old article in a new dress, being ordinary uncooked pickled mackerel with the heads and tails cut off and packed in 5-pound tin cans, one dozen cans in a case. They were introduced in 1879, and the packages being of convenient size for family use and handsomely labeled, have been quite favorably received. In 1879 there were 20,000 dozen cans, of 5 pounds each, packed in the Boston canneries.

The canning of smelts was begun late in the fall of 1879. They are thoroughly cooked in butter and packed in 1-pound cans, five dozen cans in a case. It is probable that large quantities of smelts will hereafter be preserved in tin.

A large export demand is promised for the various fish preparations in tin, and some large orders have already been filled for Europe, Australia, and the West Indies. Much improvement is constantly being made in the methods and styles of packing and labeling, and good satisfaction has been given, so that a constantly increasing demand is created, especially throughout the mining regions of this country and on the Pacific slope.

The canning industry in Boston employs seventy men, fifty-six women, and a capital of $40,000. The value of the products distributed from Boston in 1879, including those brought here from eastern canneries, was valued at $239,794.

THE LOBSTER AND CLAM INDUSTRIES.—The lobster industry of Boston is important, though not as extensive as when lobsters were more abundant. Over-fishing is said to have largely diminished the number annually taken, and stringent laws are needed to save this fish from extermination. They are received from Maine and from ports along the northern and southern shores of Massachusetts. In 1880, 2,425,125 lobsters were received in Boston, of which number 798,571 came from Maine, 300,000 from Cape Ann and vicinity, 360,954 from the south shore and Cape Cod, 50,000 from Nahant, 319,200 from Hull, and the remainder from Boston Harbor and its immediate vicinity. They are taken with the ordinary lobster pot, and are sold to the boiling establishments, where they are boiled in sea-water in large zinc-lined wooden tanks. They are then peddled in wheelbarrows throughout the city or shipped in barrels covered with tea-matting to various parts of the country, Chicago being the practical limit of distribution. Upwards of $60,000 is invested in this industry in Boston, and about one hundred men are employed.

Ninety men in and about Boston Harbor, with from forty to sixty dories, are employed during the greater part of the year in taking the soft or sand-clam, and as many more men follow the business occasionally. These clams are abundant on nearly all the flats and bottom-lands of Boston Bay. Large quantities are also received from Cape Cod, the south shore towns, Saugus River, and other points east. In all, some 75,000 bushels or 24,000 barrels of clams, costing on an average, including freight, $2 a barrel, are annually received in Boston. The outfit for a clam-digger consists of a dory, clam-rake, oars, rubber boots, and buckets, and costs about $15 for the boat and $7.50 for the other articles. Two men generally use a single boat, so that the individual investment is about $15 each.

The towns about Boston usually charge a license fee of $2 a year for the privilege of taking clams. The clams are in some cases bought up by small operators, who team them into the city,

though the diggers sometimes bring them to the city and sell them to the dealers from their boats at the wharves. Quahaugs are not generally taken, and but few sea-clams, razor-fish, or mussels. The supply of these bivalves and of scallops comes in small quantities from Cape Cod, no great amount being required to meet the demand.

THE TRADE IN OYSTERS.—The following extracts are from Mr. Ingersoll's census report on the oyster industry:

"1. HISTORY OF THE BUSINESS. When the natural beds in the Charles and Mystic Rivers gave out, Boston derived its oysters from the natural beds at Wellfleet and in Buzzard's Bay, but mainly from the first named. When, in turn, these became exterminated, toward the close of the last century, Boston dealers began to bring ship-loads of oysters from the shores of Buzzard's and Narragansett Bays, directly to the city in winter, and in the spring bedded at Wellfleet supplies for the ensuing summer and autumn. This has been explained in the account of Cape Cod, preceding this. These cargoes were taken up in the early fall, and sent in sloops and schooners to Boston. There the schooners were dismantled and tied up, or else the cargoes were transferred to hulks (old mastless vessels) and covered with so thick a layer of seaweed that no frost could get at them. These hulks were towed up into the docks close to Faneuil Hall, the recollection of which is preserved in the name of Dock Square, and there the oysters were sold to retail dealers, peddlers, and other customers, either in the shell or opened. Another favorite place for the oyster-vessels to lie was about where the Boston and Maine railway station now stands, in Haymarket square. At that time a canal, well remembered by old citizens, ran through from the Charles River to the City Wharf, following what is now Blackstone street. Another wharf for oyster-boats occupied the present site of the New England Hotel. Prices then ranged higher than now in some respects and lower in others. A bushel in the shell (at wholesale), or a gallon opened, cost $2; this was 'in liquor,' the 'solid' gallon being a recent invention. In the restaurants they charged ninepence (12½ cents) for a 'stew,' and fourpence (6¼ cents) for a 'dozen' of fourteen; or you could buy a better quality for 7 cents.

"There was a queer custom in vogue in those days, half a century ago. Besides the hawking about the streets, which has survived, a few men used to 'bag' them. Taking a bag of the bivalves on their backs, they would go in the evening to a house where there was a lively family, or, perhaps, where a company of friends had assembled. A carpet would be spread in the middle of the parlor on which the damp bag would be set, when the peddler would open the top, shuck an oyster, and pass it upon the half-shell to his nearest customer; then another for the next, and so on. Some lively scenes must have been enacted around that busy bagman, as his knife crunched rapidly through the brittle shells, and the succulent morsels disappeared down fair throats.

"Meanwhile more and more oysters were being brought every winter from Long Island Sound, Newark Bay, New Jersey, and southern waters, mainly in Cape Cod vessels, as I have shown, but somewhat, also, in Boston's own craft, for in those days there were more mackerel-fishermen hailing from the city than there now are.

"When oysters first began to be brought to Boston from Virginia, I could not ascertain with precision. The patriarch of the business, Mr. Atwood, of the firm of Atwood & Bacon, says that when he began dealing in Water street in 1826, oysters were being brought regularly from Chesapeake Bay in small quantities. He thinks the first cargo arrived about 1824. Mr. J. Y. Baker assures me that in 1830, 20,000 bushels from all quarters sufficed for Boston. About 1840 Gould estimated that 100,000 bushels would cover the consumption of all Massachusetts. Business rapidly increased, however, as the subjoined figures of the importations of oysters in cargoes from

Virginia, by Atwood & Bacon alone, will show. Besides these there were eight or ten other dealers in the city. Atwood & Bacon received—

Year.	Amount.	Year.	Amount.
	Bushels.		*Bushels.*
1846	32,575	1853	123,097
1850	90,354	1855	105,752
1851	90,587	1857	83,000

"These were by their own nine vessels alone; they had occasional cargoes otherwise. The largest lot (1853) cost them $41,853, which gives an idea of values. Freight in those days was 17 cents.

"At present very few oysters, indeed, are bedded in the vicinity of Boston, while of propagation there is none whatever. The grounds in the harbor were never very excellent, and became less so as the city increased in size. The encroachments of the building and filling in along the water-front overran the old limits of the bedding-grounds, and even the ancient natural beds. Where the Boston and Maine railway's car-house stands, a leading dealer not many years ago laid down 42,000 bushels in a single season. It was known as White Island at that time. The South Boston flats are being graded up into streets, and the Charles, Mystic, and Malden rivers, Bird Island, and other places were long ago abandoned, because the wharves or the sewerage of the city has destroyed their usefulness to the oysterman. Instead of bedding in his own harbor, therefore, the Boston dealer, as a rule, now rents ground in Buzzard's or Narragansett Bay, and lays down there (the principal grounds being about the mouth of Providence River) the Virginia oysters he proposes to use for his summer and autumn trade, or else he has abandoned the practice altogether. The process of bedding will be dwelt upon in the chapter upon the Rhode Island fisheries.

"The coming on of the war of secession found the Boston oyster trade in its most flourishing condition. More cargo-oysters were brought then than ever since; prices were high and profits large. The shipping interests fostered by it were large, too, for the competition of railways and steamers had hardly made itself felt. Most of the large dealers ran lines of vessels of their own, as well as chartering additional assistance in the spring. In the demand for fast sailers which the oyster business created, is found the origin of that celebrated model of sailing vessel that made America famous on the seas—the clipper ship. The first of these were made by Samuel Hall, a noted shipbuilder, at his yard in East Boston, and were named Despatch, Montezuma, Telegraph, and Express. They were from 90 to 126 tons, old measurement, and carried an average cargo of 2,500 bushels of oysters. Six months in the year these clippers were devoted to bringing oysters from Virginia. There were 35 or 40 of these "sail" running, and in the summer they would go fishing. The freight tariff on oysters was then 20 cents, and during the war it went as high as 25 cents a bushel.

"The war interfered sadly with the business of oystering. Often the military operations did not admit of the cultivating and raking of the beds in Virginia and Maryland, or of the schooners from northern ports going where they wished to buy. A period of higher costs and shortened sales was in store for the dealers, and they have not yet quite recovered the prosperity of 1860. The greatest period of depression was 1874–'75, when the business was almost a failure. I think none of the dealers 'suspended,' however.

"In the course of this business, as long ago as the traditions of the trade go back, a few bushels were now and then laid down in various parts of the harbor to keep them from spoiling. But this

was not at first a regular and systematic thing. The bedding-grounds were usually in the Charles, Mystic, Malden, and Pines Rivers, often above the bridges, or on the Winthrop shore. Later all the dealers bedded on the South Boston flats, which are now being wholly filled up by the New York and New England Railway. There was a large, oval, bare space here, occupied by all the dealers in the city, who had it regularly divided. Mr. J. H. Wiley's father's portion was at the extreme end, and was bounded by eel-grass. He experimented by putting oysters over, upon, and among the eel-grass, and found that they did far better than those on the open flat, which had been occupied for a long time, and ebbed dry. Mr. Wiley supposed that the reason was, that it was new ground, from which fresh and plenteous nourishment was to be derived. The grass afforded so much protection, also, that many oysters used to survive the winter.

"At present (1879–'80) the only vessels, so far as I could learn, registered in Boston and engaged in the oyster-carrying trade, are the following schooners, all the property of a single firm:

Name.	Tons.	Name.	Tons.
William H. West	68	J. M. Ball	87
Eddy Pierce	96	Neponset	74
Alice	89	Longwood	66
Barty Pierce	95	Leona	100

"2. PRESENT CONDITION OF THE OYSTER BUSINESS.—Another great change from ancient methods of conducting the business has been caused by the introduction of opened oysters from Norfolk. These are received twice a week (Tuesdays and Fridays) by steamer direct from Norfolk, and on other days, to a less extent, by steamer from Norfolk to New York, and thence by railway. In the neighborhood of 250,000 gallons were thus handled in Boston during the winter of 1879–'80, for they come only between September and April. They are shipped in barrels and kegs. The effect of this innovation has been very marked upon the trade; whether for good or ill there are two opposite opinions, the general verdict being that this feature works against the best interests of the trade. In their favor, it is said, in general, that they can be sold cheaper than any other oysters, and hence are accessible to the poorer class of people; that they are as good as the cargo-oysters, and that in the increased number sold is compensation for the diminished percentage of profit. I will quote some opinions expressed to me in this direction:

"The Boston Oyster Company considered the innovation of Norfolk opened oysters not unfavorable to business generally, although hurtful to the cargo-trade. Although higher profits were received five or six years ago, three times as many gallons are sold now as then, and hence dealers can afford to take less. Selling more cheaply a grade of goods equal to the old stock opened here, they give better satisfaction and sell more. There is less risk, also, than with cargoes, in which they had relinquished large dealings. They washed all their oysters from Norfolk carefully, and had heard no complaint of ill-health resulting from eating them.

"The Chesapeake Oyster Company deal almost wholly in opened oysters, and believe in the Norfolk trade, for the same reason as given in the report of the 'Boston' company, and say that, with their refrigerator barrels, they have no trouble with warm-weather losses. One of the advantages of this new business is, that a man can begin it with small means, since the stock may be procured in quantities as small, or large, as desired.

"R. R. Higgins thought the oysters opened in Norfolk as good by the time they got here as those of the same grade opened here out of cargoes. He used them largely, and had opened a branch house in Norfolk in order to compete with Norfolk shippers on their own ground. By sending to his customers full packages, he avoided the complaints against the Virginia shippers,

that they sent 'scant' barrels, pretending to allow for a 'swell' of the contents, which does not occur.

"This, I believe, completes the list of those who would not be glad to see the Norfolk opened oysters disappear from the market. Indeed, so strong is the prejudice, that an effort was made about two years ago to induce the legislature to forbid their importation into the State; but this failed it being opposed not only by certain consumers and carriers, but by two or three of the wholesale dealers themselves. In opposition to them it is asserted that their quality is poor; that they are unhealthy; that the losses attending them are greater than with cargoes, and that they unduly cheapen all superior grades of stock. Two grades are brought to Boston, but for one of the 'selected' come ten barrels of the 'common,' the cheapest and poorest oysters brought to the Norfolk market. The alleged injuriousness of them is said to arise from their too great age when they arrive. It is almost impossible, any way it is arranged, to get the stock from Norfolk to Boston's customers in less than a week. If they are put upon the steamer in Norfolk immediately upon being opened, come speedily, and the weather remains cold, little fault will be found. It is rare, however, that this favorable conjunction of circumstances occurs, and a large percentage of almost every cargo is thrown away. One firm dumped overboard 300 gallons out of a single shipment recently. Under such circumstances the wholesaler will save all he can, including now and then some he ought to throw away; and the same thing will occur in the shop of the retailer, so that frequently the consumer gets oysters not fit to eat. Rumors of sickness and death resulting are common enough, but I failed to trace any to a trustworthy origin in truth. They are often dirty, and are washed again and again, until the aroma and delectable flavor are all gone from their lacerated and rinsed remains. They are only fit to be cooked in a method calculated to disguise their insipidity, by the time Vermont, Maine, or Canada get them for dinner.

"Nor does it appear that a large increase of sales has followed the introduction of this new stock. Trade has changed rather than amplified, while prices have been reduced in a marked manner throughout the whole list. If, now, the wholesale dealer clears 5 cents a gallon on Virginia oysters, in shell or out, he thinks himself doing well. Most of the business is done on a much smaller margin. Considerable profit, however, is made on the 'superior grade' of Norfolk stock; but only a little of this is brought on. Worse than this, however, for Boston merchants, is the fact that Norfolk cuts out much of their regular custom. A man anywhere can buy 5 or 10 gallons and have them sent to him just (or very nearly) as cheap as the wholesaler who gets his thousand gallons. The natural result is, that many retailers and large consumers, like the hotels, do send direct to Virginia. With the cargo method this is out of the question. All consumers near Boston or other importing cities must go there for supplies. Take it all in all, Boston thoroughly deplores the innovation, but comforts herself with the conviction that already she sees signs of general dissatisfaction, and looks forward to a speedy abandonment of the new for the old method.

"A large variety of oysters are to be found on sale in Boston from widely different points. Those from the shore of Connecticut used to be highly esteemed, but they have gone out of the Boston market. The 'Cape' and 'Providence' oysters are better of late, and the expense of bringing them on is much less than from Connecticut. About five years ago the very choicest brand eaten came from Wareham, at the northern extremity of Buzzard's Bay. Now these are poor, and better ones come from Cotuit, on the 'heel' of Cape Cod, and the best of all (in my judgment) are from the Sandwich shore, particularly Monument River. The size, fine appearance, and saltness of the 'Cape' or 'native' oysters recommend them for 'bench' stock, to be eaten raw. You see

advertised also the Blue-point, Saddle-rock, Stamford, and Norwalk oysters, more familiar to New Yorkers; but they are kept for a special, small custom, as 'fancy.'

"3. EXTENT OF THE OYSTER TRADE.—It is not easy to get at the exact number of persons in Boston who derive their daily support from the oyster business. The hired help of the wholesale dealers amounts to about 125 persons the year round, with the addition of about 250 more who are engaged with greater or less steadiness to 'shuck' during the colder half of the year. The majority of these persons are married; and I believe that, including the dealers themselves, to multiply by four in each case would fairly estimate the number of souls represented—that is, the mouths fed. There are, then, in this wholesale trade, deriving their whole support, about 500 persons; deriving one-half their support, about 1,000 persons.

"It is asserted that there are about 1,000 retail shops, fish markets, hotels, and restaurants in the city where oysters form a regular part of the sales. I was unable to verify this, but am inclined to believe it rather under than over the actual number. It would be a low estimate to say, that an average of one family of 5 persons in each case is supported by the molluscan share of the business, which would add 5,000 persons to the 750 in the wholesale department, and give a total of 5,750 persons in Boston estimated to derive their living chiefly out of the oyster and clam. Most of the wholesalers run restaurants and lunch-counters. The wages paid vary with the kind of employment and the employer, all the way from $4 to $25 per week. The lowest rates are paid to the girls in the restaurant-kitchens, who get from $3 to $5 per week and their board, and to the waiters in the restaurants, who receive about $8 a week and board. The men who pack, attend to shipments and delivery of orders, who aid in bedding, and do the heavy work of the establishment, will average from $12 to $15 a week. The large addition employed between September and May are 'openers' or 'shuckers,' who are paid by the solid gallon, and work only when there are oysters to be opened. They are, as a rule, a rough, ignorant class of men. In summer they do ordinary laboring jobs, like working on the streets and carrying hods. Their pay has been a shilling (17 cents) a gallon for some years, but last season (1878–'79) 18 and occasionally 20 cents was paid; and in consequence of a strike on their part it is expected that 20 cents will be the ruling price in 1879–'80. It is rare that they earn more than $10 a week, and often not half that. The largest day's work at opening oysters that I could learn of was performed several years ago by a man in Atwood & Bacon's employ, who opened 45 gallons between 7.30 a. m. and 10.30 p. m.; but this was 'liquor' measurement, and he got only 10 cents a gallon for it. Most of the openers are married and have large families.

"Subsidiary to the oyster business in Boston is the disposal of the empty shells. These are used somewhat for filling in, particularly along the Atlantic avenue wharves, and are largely consumed by the gaslight companies to be burned into lime for purifying their gas. In addition to this there are two pulverizing establishments in East Boston that take large quantities. The shells are gathered for them by carters and boys of every grade, at odd times, from the saloons, the proprietors of which are glad to get rid of them, and taken to the factories, a few barrels at a time. The factories pay 8 cents a barrel, and often men are thus able to profitably employ their leisure. The shells are put into a crusher and then through bolts, and are thus ground into small fragments, from which the dust is sifted. The machinery employed is precisely that used for crushing bones, &c. There is a strong prejudice against the presence of any oyster-shell in the manufactured fertilizer, strange to say, and the broken shell finds a market only as food for poultry in place of fine gravel. The price is one-quarter of a cent a pound, and a barrel will weigh about 275 pounds. About 500 barrels, valued at $375, are sold annually by these factories to the henneries near Boston,

and an occasional barrel of the finer grade is sold to the bird stores, to be used in 'sanding' the floors of cages."

Statistical recapitulation of the oyster trade of Boston.

Number of wholesale dealers and shippers		10
Number of vessels engaged		8
Value of same		$20,000
Number of men hired by dealers—		
Annually	125	
Semi-annually	250	
		375
Annual earnings of same	$85,000	
Semi-annual earnings of same	35,000	
		$120,000
Number of sailors employed (three months)		40
Earnings of same		$2,500
Number of restaurant servants		1,000
Annual earnings of same		$500,000
Total number of families chiefly supported		1,500
Annual wholesales of—		
I. Native oysters (Cape Cod) bushels		15,400
Selling value of same		$15,000
II. Chesapeake "plants" bushels		*457,500
Selling value of same		$340,000
III. Fancy stock bushels		60,000
Selling value of same		$100,000
IV. Baltimore and Norfolk "open stock" gallons		350,000
Selling value of same		$250,000
Total wholesale value of oysters sold annually		$705,000

EXPORTS OF FISH PRODUCTS.—In the earlier history of the fishing industry the foreign demand was looked upon as of great importance. That it shows a decrease may be accounted for from a number of causes, among which is the fact that a constantly growing domestic demand, with a light catch during the past few years, has much of the time left the market bare for export. The home market calls for an entirely different and more profitable method of curing, that requires less labor and expense than curing for a foreign trade. Dry fish, for home trade, have an additional weight, being only lightly dried or pickle-cured, and bring as good prices as those that are hard-dried and carefully prepared for export.

The lack of steam transportation between Boston and the West Indies has at times diverted trade from this port to other markets, both domestic and foreign, where there are regular lines of steamers. For this reason a large part of our exports, being cleared from New York, does not appear on our home clearances. During the year 1879 there were about $75,000 worth of pickled fish and about $175,000 worth of dry fish exported from Boston via New York, and this amount added to the Boston clearances, $404,358, gives $654,358 as the aggregate value of Boston exports for that year. The value of fish exports direct from Boston was $781,621 in 1875, $788,196 in 1876, $619,325 in 1877, and $555,548 in 1878. During the five years from 1875 to 1879, inclusive, the total value of fish exported through the Boston custom-house was $3,149,050, of which $2,945,379 worth was of domestic production and $203,671 worth the production of the British Provinces or other countries.

The value of each year's exportation, and the countries to which fish have been exported, are shown in the following statements compiled at the Boston custom-house:

* Of these, 140,000 gallons are sold annually under the name of Providence stock.

Value of exports of domestic fish from Boston during each year from 1875 to 1879.

A.—DRIED OR SMOKED FISH.

Countries.	1875.	1876.	1877.	1878.	1879.
England	.....	$50	$862	$960	.....
French West Indies	$29,333	25,701	62,479	59,031	$15,480
British West Indies	1,418	10,330	10,200	24,849	4,131
British Possessions in Africa	2,512	1,980	4,050	5,754	2,638
Hayti	254,280	203,648	155,959	128,140	110,234
Dutch West Indies and Dutch Guiana	62,231	83,483	52,432	23,672	35,821
British Guiana	1,558	4,745	4,663	8,969	814
Azores, Madeira, &c	682	3,825	6,499	6,494	4,279
Cuba	8,257	2,957	2,880	3,533	6,587
Brazil	.....	.....	.....	654	.....
Nova Scotia, &c	5,868	80,421	12,388	28,355	31,809
French Possessions in Africa	120	75	48	1,096	.....
British Possessions in Australasia	.....	.....	.....	523	.....
San Domingo	6,309	3,069	2,470	1,113	.....
Danish West Indies	.....	508	6,272	7,044	71
Porto Rico	6,159	1,824	7,085	2,928	132
Newfoundland and Labrador	.....	350	96	1,730	.....
United States of Colombia	.....	69	164	147	.....
Sweden and Norway	.....	1,110	.....	743	.....
Liberia	.....	.....	1,639	267	.....
Portuguese Possessions in Africa	.....	.....	90	189	79
French Guiana	.....	.....	.....	7,103	28,626
Total	378,727	430,145	329,676	323,894	240,692

B.—PICKLED FISH.

Countries.	1875.	1876.	1877.	1878.	1879.
England	$1,619	$3,047	$2,808	$1,160	$5,999
French West Indies	7,833	8,198	17,660	14,491	5,498
British West Indies	3,424	10,636	12,440	10,879	5,791
British Possessions in Africa	1,653	408	86	2,556	918
Hayti	119,166	164,014	88,079	53,894	51,164
Dutch West Indies and Dutch Guiana	7,643	9,680	5,972	2,894	4,783
British Guiana	1,019	4,155	8,091	5,505	4,546
Azores, Madeira, &c	21	38	141	142	.....
Cuba	1,213	.....	.....	237	1,008
Brazil	30	.....	.....	.....	.....
Chili	30	.....	.....	.....	.....
Nova Scotia, &c	22,485	11,395	10,695	7,437	497
French Possessions in Africa	.....	.....	.....	343	.....
British Possessions in Australasia	1,618	4,112	2,150	8,065	715
San Domingo	8,635	4,196	2,782	1,250	.....
Danish West Indies	426	563	2,108	4,271	145
Porto Rico	4,150	472	2,017	1,837	469
Newfoundland and Labrador	125	.....	.....	1,932	.....
Belgium	.....	60	.....	.....	.....
Sweden and Norway	.....	3,814	7,912	5,122	.....
Liberia	.....	.....	788	715	209
Portuguese Possessions in Africa	.....	.....	.....	340	.....
French Guiana	.....	.....	.....	698	2,519
British Honduras	.....	.....	.....	.....	40
Total	181,090	164,788	164,629	123,768	84,301

Value of exports of domestic fish from Boston during each year from 1875 *to* 1879—Continued.

C.—OTHER CURED FISH.

Countries.	1875.	1876.	1877.	1878.	1879.
England	$126,522	$133,011	$73,207	$74,479	$35,566
French West Indies	86	105	1,030	564	242
British West Indies	718	1,003	113	90	475
British Possessions in Africa	1,543	240	2,072	1,062	343
Hayti	181	.....	315	.....	79
Dutch West Indies and Dutch Guiana	2,110	492	401	.....	48
British Guiana	355	651	60	232	224
Azores, Madeira, &c	91	104	161	1,000	.....
Chili	200	.....	330	520	.....
Nova Scotia, &c	2,029	114	350	1,536	489
French Possessions in Africa	105	.....	562	.....	.....
British Possessions in Australasia	7,099	6,441	11,573	13,591	11,700
San Domingo	227	.....	268	.....	.....
Danish West Indies	174	436	236	125	48
Miquelon, Langley, &c	95	172	.....	161	.....
Hawaiian Islands	54	.....	.....	.....	2,180
Newfoundland and Labrador	.....	220	.....	.....	.....
Belgium	.....	130	.....	.....	.....
United States of Colombia	.....	195	80	.....	.....
British East Indies	.....	.....	453	.....	.....
Cuba	.....	519	.....	108	52
French Guiana	.....	.....	.....	.....	.....
Total	141,589	144,733	91,211	94,308	51,446

D.—FRESH FISH.

Countries.	1875.	1876.	1877.	1878.	1879.
British Guiana	.....	.....	$340	.....	$42

Value of exports of foreign fish from Boston during each year from 1875 *to* 1879.

A.—PICKLED HERRING.

Countries.	1875.	1876.	1877.	1878.	1879.
Hayti	$1,989	.....	.....	.....	.....
Nova Scotia, &c	5,982	$150	.....	$48	.....
British Possessions in Australasia	978	.....	.....	.....	.....
Sweden and Norway	.....	4,954	$9,088	.....	.....
Total	8,949	5,104	9,088	48	.....

B.—PICKLED MACKEREL.

Countries.	1875.	1876.	1877.	1878.	1879.
French West Indies	$162	.....	.....	.....	.....
British West Indies	.....	$3,700	.....	$408	.....
Hayti	815	.....	.....	.....	.....
Nova Scotia, &c	4,300	.....	$75	434	$400
Porto Rico	.....	.....	.....	700	.....
Total	5,277	3,700	75	1,542	400

Value of exports of foreign fish from Boston during each year from 1875 to 1879—Continued.

C.—OTHER FISH, FREE OF DUTY, NOT ELSEWHERE SPECIFIED.

Countries.	1875.	1876.	1877.	1878.	1879.
England	$44,490	$29,390	$12,855	$4,372	$4,840
French West Indies	3,999	1,699	5,409	3,268	109
British West Indies	683	2,692	.....	.....	.....
Azores, Madeira, &c	.....	.....	.....	.....	500
Cuba	.....	.....	.....	.....	18,692
Nova Scotia, &c	.....	5,945	5,462	794	.....
British Possessions in Australasia	461	.....	80	3,554	1,537
Hawaiian Islands	.....	.....	.....	.....	616
Newfoundland and Labrador	76	.....	500	.....	.....
Scotland	.....	.....	.....	.....	1,022
Total	49,709	39,726	24,306	11,988	27,307

D.—OTHER FISH, SUBJECT TO DUTY, NOT ELSEWHERE SPECIFIED.

Countries.	1875.	1876.	1877.	1878.	1879.
England	$11,124	.....	.....	.....	.....
Hayti	.....	.....	.....	.....	$170
British Possessions in Australasia	5,158	.....	.....	.....	.....
Total	16,282	.....	.....	.....	170

IMPORTS OF FISH PRODUCTS.—The importation of fishery products from the British Provinces is an important element in the fish business of Boston. From statistics compiled at the Boston custom-house we find that the total value of fish and fish oils received in Boston from Canada and Newfoundland during the 10 years from 1870 to 1879, inclusive, was $9,362,754, which includes pickled mackerel $4,239,992, herring $1,351,193, fresh fish $307,955, other fish $2,840,417, and fish oils $623,197. The following tabulated statements show these imports in detail for each of the above years:

Value of fish imported into Boston from Dominion of Canada and Newfoundland during the years 1870 to 1877.

DOMINION OF CANADA.

Year.	Herring.		Mackerel.		Fresh fish.		Other fish.		Total.	
	Value.	Duty.	Value.	Duty.	Value.	Duty.	Value.	Duty.	Value.	Duty.
1870	$136,304	$36,537 50	$154,563	$30,175 74	$19,136	Free	$256,391	$44,840 41	$636,438	$125,682 37
Prince Edward Island	10,701	3,374 50	43,957	8,263 00	None.	..do	15,386	2,491 22		
1870 (total)	147,005	39,912 00	198,520	38,438 74	19,136	..do	271,777	47,331 63	.....	.....
1871	80,434	21,611 50	223,889	66,248 50	26,145	..do	108,402	20,997 76	438,870	108,857 76
1872	58,390	17,845 50	248,067	86,023 00	41,544	..do	248,934	61,218 18	596,935	165,086 68
1873	104,634	2,621 00	713,116	30,101 00	27,428	..do	245,706	8,861 00	1,091,084	41,583 00
1874	130,118	.....	455,977	.....	29,332	..do	415,821	.....	1,031,248	.....
1875	155,561	.....	489,680	.....	28,142	..do	246,796	.....	920,179	.....
1876	114,484	.....	297,836	.....	26,005	..do	132,258	.....	570,583	.....
1877	77,854	.....	723,527	.....	19,622	..do	214,142	.....	1,035,144	.....
Total	868,680	81,990 00	3,350,612	220,811 24	217,353	.....	1,883,836	138,408 57	6,320,481	441,209 81

Value of fish imported into Boston from Dominion of Canada and Newfoundland during the years 1870 *to* 1877—Continued.

NEWFOUNDLAND.

Year.	Herring.		Mackerel.		Fresh fish.		Other fish.		Total.	
	Value.	Duty.	Value.	Duty.	Value.	Duty.	Value.	Duty.	Value.	Duty.
1870	$20, 865	$5, 781	$101	$24	$1, 230	Free	$93, 228	$15, 904 04	$115, 424	$20, 809 04
1871	19, 439	5, 156	8, 844	2, 335	None.	..do	50, 656	8, 672 87	78, 939	16, 163 87
1872	12, 178	4, 095	869	258	718	..do	66, 528	10, 680 81	80, 293	15, 033 81
1873	18, 377	5, 922	26	9	4, 840	..do	61, 750	11, 528 00	84, 993	17, 459 00
1874	24, 749	270	None.		2, 861	..do	90, 807	757 00	118, 417	1, 027 00
1875	44, 468		14, 213		39, 681	..do	62, 211		160, 573	
1876	55, 392		None.		7, 874	..do	20, 517		83, 783	
1877	57, 753		8			..do	39, 208		96, 969	
Total	253, 221	21, 224	24, 061	2, 626	57, 204		484, 905	46, 642 72	819, 391	70, 492 72

Total value of fish imported into Boston from Dominion of Canada and Newfoundland from 1870 *to* 1877.

Provinces.	Herring.		Mackerel.		Fresh fish.		Other fish.		Total.	
	Value.	Duty.	Value.	Duty.	Value.	Duty.	Value.	Duty.	Value.	Duty.
Dominion of Canada	$868, 680	$81, 990	$3, 350, 612	$220, 811 24	$217, 353	Free	$1, 883, 836	$138, 408 57	$6, 320, 481	$441, 209 81
Newfoundland	253, 221	21, 224	24, 061	2, 626 00	57, 204	..do	484, 905	46, 642 72	819, 391	70, 492 72
Total	1, 121, 901	103, 214	3, 374, 673	223, 437 24	274, 557		2, 368, 741	185, 051 29	7, 139, 872	511, 702 53

Quantity and value of fish oils imported into Boston from Dominion of Canada and Newfoundland during the years 1870 *to* 1877.

Year.	From Dominion of Canada.			From Newfoundland.		
	Gallons.	Value.	Duty.	Gallons.	Value.	Duty.
1870	38, 786	$20, 700	$5, 189 70	54, 751	$30, 192	$8, 713 15
1871	44, 594	20, 101	4, 291 00	92, 961	52, 036	13, 553 40
1872	96, 229	42, 126	8, 460 15	81, 705	38, 817	7, 763 40
1873	68, 955	34, 052	312 00	47, 883	32, 335	6, 429 00
1874	74, 721	44, 254		56, 366	37, 660	1, 787 00
1875	96, 846	49, 332	212 00	13, 449	10, 265	
1876	69, 076	37, 340		8, 556	9, 471	
1877	135, 101	67, 141		8, 940	6, 327	
	624, 308	315, 046	18, 464 85	364, 611	217, 103	38, 245 95

Total quantity and value of fish oils imported into Boston from Dominion of Canada and Newfoundland from 1870 *to* 1877.

Provinces.	Gallons.	Value.	Duty.
Dominion of Canada	624, 308	$315, 046	$18, 464 85
Newfoundland	364, 611	217, 103	38, 245 95
Total	988, 919	532, 149	56, 710 80

Total importations of fish and fish oils into Boston from Dominion of Canada and Newfoundland from 1870 *to* 1877.

Products.	Gallons.	Value.	Duty.
Fish		$7, 139, 872 00	$511, 702 53
Fish oils	988, 919	532, 149 00	56, 710 80
Total	988, 919	7, 672, 021 00	568, 413 33

Quantity and value of fish imported into Boston from Dominion of Canada and Newfoundland during the years 1878 and 1879.

DOMINION OF CANADA.

Year.	Herring.		Mackerel.		Fresh fish.		Other fish.	Total.
	Barrels.	*Value.*	*Barrels.*	*Value.*	*Pounds.*	*Value.*	*Value.*	*Value.*
1878	28, 667	$96, 826	75, 628	$524, 637	507, 950	$17, 718	$167, 896	$807, 077
1879	30, 325	94, 800	77, 338	339, 729	257, 640	11, 165	253, 618	699, 312
Total	58, 992	191, 626	152, 966	864, 366	765, 590	28, 883	421, 514	1, 506, 389

NEWFOUNDLAND.

1878	6, 657	$25, 590	2	$6	$644, 000	$4, 146	$24, 500	$54, 242
1879	5, 066	12, 076	195	947	90, 000	369	25, 662	39, 054
Total	11, 723	37, 666	197	953	734, 000	4, 515	50, 162	93, 296

Quantity and value of fish oils imported into Boston from Dominion of Canada and Newfoundland during the years 1878 and 1879.

Year.	Dominion of Canada.		Newfoundland.		Total.	
	Gallons.	*Value.*	*Gallons.*	*Value.*	*Gallons.*	*Value.*
1878	66, 581	$23, 180	2, 500	$512	69, 081	$23, 692
1879	148, 511	52, 623	35, 969	14, 733	184, 480	67, 356
Total	215, 092	75, 803	38, 469	15, 245	253, 561	91, 048

ICE AND SALT USED IN THE FISHERIES.—Ice is now considered as necessary as bait or other indispensable articles in the outfit of the market fishing vessel. Large quantities of ice are also used by the receivers of fresh fish. It is delivered at the wharf to vessels or stores in large blocks. When wanted for packing fish, it is cut up and shoveled into a crusher, where it is broken into small pieces, and is then freely used in packing fish in boxes for transportation to all parts of the country. Previous to 1845 it was seldom if ever taken to sea by the fishermen. Vessels in that year began taking ice on halibut trips, returning with the fish on ice. Although fish thus preserved were in good condition, they found a slow sale. Dealers said, "They have been on ice and that has spoiled them." Notwithstanding this prejudice, the use of ice became general, and, with the growth of the fish business, has shown a steady increase, so that vessels now use more or less at all seasons of the year. The amount taken on a trip depends on the state of the weather, the size of the vessel, and the probable length of the trip. In winter 1 or 2 tons, and in warm weather from 5 to 10 tons, are average quantities. The price is very changeable, an open or very cold winter permitting the harvesting of a short or full supply. During 1879 the price from January 1 to May 1 was $3.50 a ton, and from May 1 to January 1, 1880, $3 a ton. The winter of 1879–'80 being mild, but a very small crop of ice was secured in Massachusetts, and the supply came chiefly from Maine. The price advanced, April 1, 1880, from $3 to $4, and on May 1 was $5 a ton. The fresh-fish stores and vessels of Boston are supplied by the Union Ice Company, that employs thirty men and has a capital of $60,000.

According to the statement of James Emery, jr., and Charles W. Hallstram, of the Union Ice Company, the following quantities of ice were used in the Boston fisheries in each month of 1879:

Month.	Vessels.	Stores.	Total.	
	Pounds.	*Pounds.*	*Pounds.*	*Value.*
January	4,000	50,000	54,000	.....
February	8,000	.....	8,000	.....
March	86,000	394,000	480,000	.....
April	108,000	372,000	480,000	.....
May	857,370	1,374,717	2,232,087	.....
June	843,400	1,449,770	2,293,170	.....
July	1,293,434	1,558,320	2,851,754	.....
August	1,488,700	1,637,587	3,126,287	.....
September	1,555,600	1,990,387	3,545,987	.....
October	1,229,000	1,533,000	2,762,000	.....
November	236,000	701,000	937,000	.....
December	128,000	555,000	683,000	.....
Total	7,837,504	11,615,781	19,453,285	$32,410

Fishing vessels from many of the New England ports take more or less salt in bond from Boston. The Grand Bank cod-fishing vessels generally use Trapani salt; for mackerel, salt from Cadiz and Liverpool is preferred; while for herring Liverpool salt is mostly used. It is sold by the hogshead, holding 8 bushels, or 560 pounds, of salt. During 1879 prices rated very low; Cadiz salt sold at $1.25, Trapani at $1.35 to $1.40, and Liverpool 80 cents to $1.20 per hogshead. The present season of 1880 it has advanced considerably, and prices through the spring were as follows: Cadiz $1.50 to 1.65, Trapani $1.69 to $1.75, and Liverpool $1.20 per hogshead. Since the removal of a bounty on codfish in 1866, Congress has permitted the fishermen to use what salt is necessary for the cure of their fish free of duty. They do not seem to appreciate or consider it much of a grant to them as long as they have to pay what they think are excessive weighing fees; or, as they say, "the duty is yet on, only in another form." In 1799 Congress passed a law charging 50 cents for weighing 100 bushels of 56 pounds each. In 1816 this fee was increased to 75 cents, the Government weighing each bushel and paying for the labor. The tax or weighing fee was only on bonded salt. The fishermen receiving a bounty and paying a duty had no weighing fees to pay. This old law is said to have remained dormant for over fifty years, and was brought from its retreat by the officers of the Boston custom-house some years ago. The tax was collected at this port, and no other, for some time, until a protest was made which brought forth a general Treasury order to enforce it at all ports. As the law granting fishermen salt duty free provides for their payment of the *actual* weighing expenses, they seem to think the present tax of 7½ cents a hoghshead unjust, excessive, and not the true intent of the law. For a vessel handling 500 hogsheads of salt this tax amounts to $37.50 as fees for a weigher who weighs only 10 or 20 hogsheads as an average, and all the labor-hire is paid by the vessel. Much complaint is heard at all ports in which the fisheries are carried on.*

The amount of salt withdrawn from the Boston custom-house in 1879 for use in the fisheries was 20,413,200 pounds, or 36,452 hogsheads, having a market value of $54,678. There are five firms in Boston, with a capital of $75,000 and employing fifty men, engaged in the importation of salt and supplying the fish trade as a part of their business.

*In the spring of 1882 Congress modified the customs laws, so that this unjust tax is now removed.

The quantities of salt withdrawn in bond from the Boston custom-house, from 1872 to 1880, for use in the fisheries, and the invoice value of the same, or the cost at the foreign port of lading, were as follows:

Year.	Pounds.	Invoice value.
1872	12,592,600	$11,824
1873	14,082,400	12,583
1874	16,663,600	15,084
1875	13,547,300	12,248
1876	14,824,700	14,415
1877	16,898,450	17,179
1878	19,065,040	16,313
1879	20,413,200	19,406
Total	128,147,650	119,052

INDUSTRIES RELATED TO THE FISHERIES.—The manufacture of isinglass from fish sounds is an important branch of business in connection with the fishing industry. The sounds are received from the various fishing ports and also from foreign countries. They are soaked and ground up into pulp, and the mass is then rolled into long thin sheets of excellent isinglass or glue, that is used for refining beer and for various other purposes. There are several isinglass factories in Boston, and two or three in other parts of the State, controlled by Boston capital.

During the past few years more attention has each year been given to the fertilizing qualities contained in the large amount of fish waste and scrap that was formerly constantly thrown away. Three of the fertilizer factories in and around Boston use fish products, and these factories make a specialty of this line, utilizing all the scrap and waste from the numerous boneless-fish factories, menhaden chum, and the large amount of refuse from the market fishermen, such as fish-heads and all kinds of unmarketable fish, for which the fishermen receive quite a sum. In fact, everything connected with the fish that was formerly thrown away is now utilized at the fertilizer factories.

The process of manufacture is simple, and varies but little in any of the factories. Fish scrap, bone phosphate, and sulphuric acid are the principal ingredients used by all the factories. The use of this fertilizing material has shown such favorable results that the demand is consequently on the increase. Dealers give the following as the distribution from the New England factories during 1879: New York, 40,000 tons; North Carolina, 20,000 tons; South Carolina, 20,000 tons; Virginia, 45,000 tons; Georgia, 45,000 tons; New England, 10,000 tons. Maryland and New Jersey take a less amount, and the newer States of the West as yet care for but little, if any, fertilizing compounds. A large amount is also exported to the West Indies. During 1879 the total amount of fertilizers manufactured in the three Boston factories was 14,000 tons, valued at from $25 to $35 per ton. The proportional part of the business belonging to the credit of the fishing industry is about $100,000 capital, ninety men, and $140,000 as the value of the product.

Of the large number of barrels, drums, boxes, and smaller packages required in the fishing business, Maine furnishes nearly all the barrels, one-fourth of the drums, and most of the large boxes used in packing fresh and dry fish. The boxes arrive in shooks, all ready to be put together as required. Kits, half and quarter barrels, for this market are mostly made at Townsend, Mass., where there are five factories and numerous small dealers. There is also one factory at each of the following towns in New Hampshire: Hollis, Brookline, Merrimack, and Milford. One-fourth of the products of the Massachusetts and New Hampshire factories are used by dealers in Boston, and the remainder in the Gloucester, New York, Philadelphia, and the Western Lake fisheries. The boneless-fish trade demand for boxes, holding from 5 to 40 pounds, is supplied from Middle-

borough and other small inland towns. Boston has five small shops that manufactured 18,000 drums and 10,000 barrels during 1879. These shops employed seventeen men, a capital of $10,000, and the value of the production was $23,000.

The towns of Hollis, Brookline, Merrimack, and Milford, N. H., produced 300,000 half and quarter barrels and kits; 75,000 of which were used in Boston. The capital invested at these places aggregates $50,000, and the value of the products is $75,000. The number of men employed is one hundred.

At Townsend, Mass., five factories, with numerous small dealers, employed one hundred and fifty men, with an active capital and machinery valued at $100,000. They produced 400,000 packages, worth $100,000. One hundred thousand of these packages were kits, holding from 10 to 20 pounds each; of which Boston dealers used one-third; Gloucester, New York, and Philadelphia one-third; the lake fisheries and cities of the West one-third. Messrs. B. & A. D. Fessenden, the largest manufacturers at Townsend, also have a factory at Sandusky, Ohio, where they made 100,000 quarter and half barrels during 1879, for the fish trade of the Great Lakes.

The number of boneless-fish boxes made in New England towns during 1879 was 400,000, valued at about $40,000. The capital employed in their manufacture was $20,000, and the number of men was twenty-five.

The total amount of capital employed in New Hampshire and Massachusetts in the manufacture of packages, chiefly for the Boston fish trade, is $180,000, and the number of men in the factories is two hundred and ninety-two. The number of packages produced in 1879 was about 1,128,000, valued at $238,000.

There are four establishments in Boston and Cambridge engaged in the manufacture of oil clothing and hats, used in various branches of business. The proportional part for fishermen's use gives average steady employment to one hundred persons the entire year, over three hundred being engaged at times during the year. The goods manufactured are mostly sold along the Atlantic coast north of the Potomac, though a small portion of them goes to the lake or river fishermen of the Middle and Western States. The goods manufactured are of excellent quality and design, and number over a score of varieties of suits, with as many grades and styles of head gear. The capital in this branch of business is about $42,000, and the number of hands employed is one hundred. The value of the products used in the fisheries is about $109,000.

The numerous ship-chandlery and hardware stores supply the fishing vessels to a limited extent with all that is required, but most of the outfit used on the fleet is furnished by the only exclusive fishing supply store of Messrs. Nickerson & Baxter. The sales of fish lines and hooks by this single firm during 1879 will give some idea of the extent of the fishing interest. Among their sales were the following items: 7,148 dozen tarred cotton fish lines, weighing 88,053 pounds, used for trawl and hand line fishing; 300 dozen imported hemp lines, of 4,500 pounds' weight, used in cod fishing; 908,767 pounds of white cotton hand lines, used for gauging; 25,000 gross of imported Scotch hooks; 50,000 gross of American manufactured hooks, mostly used for ground fishing. A large trade was formerly done in mackerel hooks, but at present the catch being mostly by seines, only a limited amount are used, so that of hooks for this fishing only 40,000 attached to metal jigs were sold. The aggregate sales of lines and hooks by this one firm was 1,001,320 pounds of fish line and 7,840,000 fish-hooks. We have noticed only the two leading specialties of the many numerous articles found in a supply store, in order to show something of the amount of the fishing industry. If we add to the above the amount sold by the numerous small dealers and ship chandlers, the aggregate would be much more. There is invested in this

business about $75,000 capital, and about twenty-five men are employed. The total value of sales of fishing supplies amounts to about $200,000.

The manufacture of nets and seines is an important industry, entirely dependent on the fisheries for its support. For many years Boston has done a large business in those articles, and at present has $300,000 invested in factories that give employment to seventy-one men and two hundred and four women. The value of nets and seines made by these factories in 1879 was $275,000. The first net factory in Boston was started in 1842, and until 1866 the work was done by hand. At the latter date machines were imported, and now most of the knitting is done by them.

68. MEDFORD, BRAINTREE, AND QUINCY.

MEDFORD.—Medford is a suburban town of Boston, on the Mystic River. Its history shows that it was once the seat of a quite profitable river fishery. Ten men now follow the business of taking alewives in the Mystic River at a point 6 miles from its outlet into Boston Harbor. The catch is small, because of the restrictions of the State law, which prohibits the use of seines or gill-nets. In 1879 the total catch was 600 barrels of alewives, worth about $1,200, sold to market fishermen of Boston for bait.

BRAINTREE AND QUINCY.—The towns of Braintree and Quincy, situated a few miles south of Boston, are not now concerned in the fisheries, though in past years they attained to considerable importance as fishing ports. An excellent review of the fishing interests of these old towns in past years is given in W. S. Pattee's History of Old Braintree and Quincy. From this work we learn that the town took action concerning its fisheries as early as 1755, and persons who engaged in the cod fishery were exempted from poll tax. In 1836 the business amounted to about $30,000, and employed ten vessels, that caught 6,200 quintals of cod, valued at about $18,000, and 1,750 barrels of mackerel, worth $12,242. About one hundred persons were employed in the industry. About the year 1840 two or three whaling vessels were owned here.

69. FISHING TOWNS FROM WEYMOUTH TO COHASSET.

WEYMOUTH.—The fishing industry of Weymouth is represented by one isinglass factory and one factory for making fertilizers. The former, in 1879, produced 70,000 pounds of isinglass, valued at $122,500. It employs forty men, and has a capital of $125,000. The latter factory employs a large number of men, and has a capital of some $300,000. About one-fourth of the material used in making the fertilizers is fish products, received from various parts of the coast. Six thousand tons of fertilizers, worth $180,000, were made in 1879. In former years this town had an alewife fishery; and in 1639 the General Court granted liberty to the town "to build a weare where it may not preiudice any mans p'priety."

HULL.—Hull is a little village situated in Boston Bay, at the extreme northern end of Plymouth County; it is 8 miles by water from Boston, and is almost entirely surrounded by water, being connected with the mainland of Nantasket by a very narrow causeway. For nearly 250 years the fishing business has been followed here to a greater or less extent. At the present time the only fishery receiving any attention is the lobster catch. There are 33 men engaged in this business; they own 33 boats, and set 3,240 pots about the ledges of Hull and Boston Bay. These pots are set in trawls, each containing 25 of them. A few men, usually not more than half a dozen, follow the business through the winter. April, May, September, and October are the best months in which to prosecute this fishery. During June, July, and August the catch is not only lighter but the quality of the lobsters caught is poorer, the fish at that season being, as the fishermen say,

soft lobsters. The State law, as to size, is said to be well observed; yet the catch yearly shows a decrease in size and number. The practice of wedging the claws of the lobsters is not followed here. The larger portion of the catch is sent to the Boston market. Occasionally large lobsters are taken in Boston Harbor. One weighing 16, and another weighing 21 pounds, were noticed among the catch of last year. A few small vessels are engaged in the shore herring fishery in October.

HINGHAM.—Hingham, situated 12 miles southeast from Boston, was in past years known as a fishing port of considerable importance. To this place at one time belonged a large number of vessels engaged in the mackerel fishery. As railroads and other industries of recent date sprang up, the fishery interest decreased from year to year. The harbor has been allowed to become obstructed, and the wharves to decay; and, by degrees, the port at last has ceased to be recognized as a fishing place of any importance. Three vessels received fishing licenses during 1879; two of them having been sold, one sail alone remains to represent the fishery industry of Hingham.*

COHASSET.—Cohasset, situated 20 miles southeast from Boston, with a fine harbor, at one time had a good fishing fleet, as is seen by the records of the custom-house. Formerly, numerous firms were engaged in the fisheries, but at the present time the port is noted more for its attractions as a seaside resort than for anything else. The fishing industry is now represented by only two firms, both of which are engaged in the mackerel fishery. They have been in the business for over fifty years, and in 1879 fitted out only six vessels. A few dories and small boats fish near the shore for cod and lobsters. A number of vessels formerly went from this place annually to the Grand Banks for cod; none have been since 1845, in which year three were sent. Ten men are engaged in gathering Irish moss. Five hundred barrels of it were produced in 1879. Twenty men are occupied in catching lobsters and shore fish. Marine products secured in 1879 were worth $34,339, and included 4,783 barrels of shore mackerel, 217 barrels of Bay of Saint Lawrence mackerel, 175,000 pounds of shore fish, 60,000 lobsters, and 500 barrels of Irish moss. The fishing fleet included eight vessels, aggregating 521.51 tons, ten dories, and ten lapstreak boats. The number of persons employed was one hundred and nineteen, more than half of whom were Portuguese.

G.—THE DISTRICT OF PLYMOUTH.

70. GENERAL REVIEW OF THE DISTRICT.

PRESENT EXTENT OF THE FISHERIES.—The fisheries in Plymouth district, which includes the towns of Scituate, Duxbury, Kingston, and Plymouth, are not nearly as important at the present time as in past years, when a large fleet of cod and mackerel fishermen sailed from these ports. An annexed tabulated statement shows the extent of the cod fisheries from 1815 to 1879. We find that in 1853 there were eighty-nine vessels of 25,595.86 tons in this fishery, and that they brought home 56,313 quintals of cod and 22,223 gallons of oil. In 1879 the product of the fleet was 12,500 quintals of cod and 3,465 gallons of oil.

The business of gathering Irish moss is largely carried on at Scituate. This business was begun here in 1853, and Scituate has now grown to be the headquarters in New England for that article. Shore fisheries for cod, mackerel, and other species are carried on to a small extent. A

*In the summer of 1881 the schooner Exchange, the last of the once large Hingham mackerel fleet, was sold to Cape Cod.

considerable quantity of lobsters and clams are also taken along the shores and from the flats in the harbors.

The total capital invested in the fisheries of the district is $133,096, and the value of the products is $138,443. The number of persons employed is six hundred and eighty-six.

STATISTICAL SUMMATION FOR 1879.—The following statements give in detail the extent of the fishing interests of Plymouth district:

Summary statement of persons employed and capital invested.

Persons employed.	Number.	Capital invested.	Amount.
Number of vessel-fishermen	228	Capital in vessels and boats	$93,700
Number of boat-fishermen	414	Capital in nets and traps	7,396
Number of curers, packers, fitters, &c	44	Other fixed and circulating capital	*a* 32,000
Total	686	Total	133,096

a Cash capital, $18,000; wharves, shorehouses, and fixtures, $14,000.

Detailed statement of capital invested in vessels, boats, nets, and traps.

Vessels and boats.	No.	Tonnage.	Value.	Value of gear, exclusive of boats and nets.	Value of outfit.	Total value.	Nets and traps.	No.	Value.
Vessels.							***Nets.***		
In food-fish fishery:							Gill-nets:		
Active	25	1,129.67	$33,750	$9,250	$33,450	$76,450	In vessel fisheries	8	$96
Idle	1	54.58	600			600	Purse-seines:		
Total	26	1,184.25	34,350	9,250	33,450	77,050	In vessel fisheries	5	2,800
Boats.							Total	13	2,896
In vessel fisheries	121		3,100			3,100	***Traps.***		
In shore fisheries	241		8,320	2,130	3,100	13,550	Lobster and eel pots	4,500	4,500
Total	362		11,420	2,130	3,100	16,650			

Detailed statement of the quantities and values of the products.

Products specified.	Pounds, fresh.	Pounds, prepared.	Bulk.	Value prepared.
Grand total				$138,443
Fresh fish.				
Cod	945,000			14,175
Cunners	15,000			75
Cusk	1,000			7
Flounders	2,000			30
Haddock	273,000			3,631
Hake	36,000			216
Mackerel	440,000			5,852
Pollock	5,000			20
Mixed fish	450,000			2,250
Total	2,167,000			26,256
Dry fish.				
Cod	4,326,095	1,730,438		62,296
Cusk	3,778	1,889		51
Haddock	40,900	15,557		311
Hake	51,860	23,336		373
Pollock	16,260	6,668		113
Total	4,438,893	1,777,888		63,144

Detailed statement of the quantities and values of the products—Continued.

Products specified.	Pounds, fresh.	Pounds, prepared.	Bulk.	Value prepared.
Pickled fish.				
Swordfish	7,000	4,000		$130
Mixed fish	6,000	4,000		100
Total	13,000	8,000		230
Shell fish.				
Lobsters	721,050			26,438
Clams, for food			10,000 bushels	5,000
Total	721,050			31,438
Miscellaneous.				
Fish oil			6,464 gallons	2,585
Fish sounds (dried)		350		315
Irish moss		405,000		14,175
Seaweed			300 tons	300
Total				17,375

THE COD FISHERY FROM 1815 TO 1879.—The following tabulated statement, compiled from the custom-house records, shows the extent of the cod fisheries of Plymouth customs district for the years 1815 to 1879:

Year.	No. of vessels.	Bounty.	Quintals of cod.	Gallons of oil.	Year.	No. of vessels.	Bounty.	Quintals of cod.	Gallons of oil.
1815	39	$7,854 48	19,560		1848	60	$19,123 31	50,974	19,862
1816	56	12,295 45	28,150		1849	63	17,726 83	48,683	19,742
1817	67	15,014 76	33,580		1850	65	18,011 05	51,665	23,259
1818	71	15,991 36	35,560		1851	71	19,443 18	51,970	19,742
1819	85	20,475 07	42,530		1852	67	20,261 86	49,371	21,155
1820	60	14,894 91	30,600		1853	89	25,595 86	56,313	22,223
1821	53	12,403 15	26,500		1854	69	19,325 50	41,424	13,169
1822	61	14,302 00	30,000		1855	73	19,778 84	36,670	13,736
1823	65	15,256 70	32,500		1856	62	16,012 38	37,968	15,216
1824	62	14,327 03	31,000		1857	67	16,917 50	37,587	16,735
1825	61	13,450 15	30,000		1858	64	16,287 04	32,544	18,192
1826	48	9,534 14	24,000		1859	64	16,377 36	33,353	17,896
1827	59	12,521 53	29,907		1860	63	16,072 43	36,049	17,513
1828	81	17,929 20	48,219		1861	61	15,683 02	32,379	19,642
1829	68	15,490 91	35,270		1862	58	15,340 43	34,842	19,678
1830	71	15,105 86	33,218		1863	58	15,548 04	37,964	19,342
1831	75	17,352 00	43,705		1864	62	17,074 55	41,706	22,358
1832	67	15,371 18	37,578		1865	54	10,956 89	42,590	24,593
1833	69	17,382 80	48,199		1866	52	10,836 99	39,639	25,165
1834	73	19,165 73	54,555		1867*			38,100	22,300
1835	76	20,286 30	56,903		1868			37,700	18,490
1836	89	24,386 50	57,965		1869			39,700	18,553
1837	87	23,852 69	44,776		1870			35,300	18,679
1838	86	23,067 49	51,776		1871			32,000	16,789
1839	94	27,027 96	62,763		1872			25,700	14,270
1840	73	19,262 76	39,601		1873			28,900	13,608
1841	60	15,625 70	34,753		1874			9,512	3,397
1842	52	13,582 19	32,300		1875			11,480	2,898
1843	72	18,415 15	48,200		1876			14,342	4,441
1844	87	23,975 40	54,150		1877			13,310	3,813
1845	77	21,774 85	50,142		1878			12,902	3,591
1846	64	18,123 03	40,526		1879			12,500	3,465
1847	57	14,858 91	40,669	20,495					

* Not any bounty since 1866.

EXPORTS OF FISH FROM 1803 to 1879.—The following tabulated statements compiled from the custom-house records show the importance of the export trade in dry and pickled fish from the customs district of Plymouth, for the years 1803 to 1878:

A.—*Exports from* 1803 *to* 1819.

Quarter ending—	Value per quintal.	Value per barrel.	To British West Indies.		To French West Indies.		To Spanish European ports.		To Portugal.	To Spanish West Indies.	To Madeira.	To Azores.	To French European ports.	To Swedish West Indies.	To Gibraltar.	To Leghorn.
			Qtls.	*Bbls.*	*Qtls.*	*Bbls.*	*Qtls.*	*Bbls.*	*Qtls.*	*Qtls.*	*Qtls.*	*Qtls.*	*Qtls.*	*Qtls.*	*Qtls.*	*Qtls.*
June 30, 1803	$4 00	$4 00	80	229	4,050	263	5,515		90							
September 30, 1803	4 00		1,164						1,500	3,037						
December 31, 1803	4 25	6 00					3,170	89		770						
March 31, 1804	4 00	4 00					2,785	121		6,792						
June 30, 1804	4 33	4 00			4,607	183	8,658									
September 30, 1804	4 25	4 25			3,581	78	1,459		640							
December 31, 1804	4 00				5,242		8,459									
March 31, 1805	4 00	4 25	382		5,700	146	1,525				1,150					
June 30, 1805	4 25	4 00			5,382	50	7,050		295							
September 30, 1805	4 00	4 00			2,379	10						400				
December 31, 1805	4 25				8,494		27,268		25			1,020				
March 31, 1806	4 00				7,145		1,553									
June 30, 1806	4 00	6 00	849	2	6,538	2	4,370									
September 30, 1806	4 50	7 00			3,095	4	1,310						1,800			
December 31, 1806	4 25	14 00			5,159		15,840	20	25		821					
March 31, 1807	4 50				3,584		5,000		30				1,250			
June 30, 1807	4 25				1,950		1,460									
September 30, 1807	4 25	25 00			2,084		2,682	20								
December 31, 1807	3 50				5,176		3,420				622					
March 31, 1809	1 50				170					807	423			6,748		
June 30, 1809	2 50						1,950			1,900				10,563		
September 30, 1809	2 00	4 00	8,332			35	500		220					1,056		
December 31, 1809	2 50						10,290			700				400		
March 31, 1810	2 00						2,850			564				1,020		
June 30, 1810	2 00	5 00	3,560	7										2,965		
September 30, 1810	3 00	5 00	3,207			39										
December 31, 1810	3 50		3,495						2,100	347				1,144		
March 31, 1811	4 00	15 00			3,550	30								2,240		
June 30, 1811	4 00									1,070				3,510		
September 30, 1811	3 00									2,070						
December 31, 1811	3 00		1,070							1,176				1,236		
March 31, 1812	3 50									5,482						
June 30, 1812	3 00								300					2,350		
June 30, 1815	4 00				620											
September 30, 1815	4 25				1,350											
December 31, 1815	4 50				1,460		2,200									
June 30, 1816	4 00				1,961											
September 30, 1816	3 50				2,913											
December 31, 1816	3 00				4,611				1,950							
March 31, 1817	2 50				2,990											
June 30, 1817	3 60				4,278											
September 30, 1817	3 00				1,952											
December 31, 1817	4 00						1,675								4,500	
March 31, 1818	3 00				10,080											
June 30, 1818	4 00				2,580											
September 30, 1818	3 50				2,862											
December 31, 1818	3 50				1,200					90					2,112	
March 31, 1819	3 50				1,100											
June 30, 1819	4 00				2,200											2,000
September 30, 1819	4 00															2,200
December 31, 1819	4 00				1,238											

B.—*Exports from* 1820 *to* 1878.

Quarter ending—	Value per quintal.	Value per barrel.	To French West Indies.		To Spanish West Indies.		To Gibraltar.	To Hayti.	To Danish West Indies.	To Nova Scotia.
			Quintals.	*Barrels.*	*Quintals.*	*Barrels.*	*Quintals.*	*Quintals.*	*Quintals.*	*Quintals.*
March 31, 1820	$4 00	$5 00	2,500		100	191	1,308			
June 30, 1820	4 00		1,880							
September 30, 1820	3 00	5 00	1,465	335						
December 31, 1820	3 00		740							
March 31, 1821	2 50	3 50	2,240	222						
June 30, 1821	3 00	4 00	1,091	50						
September 30, 1821	3 00	3 00	1,063	115						
December 31, 1821	3 00	3 50	1,607	164						
March 31, 1822	3 00		930							
June 30, 1822	3 50	4 00	1,030	60						
December 31, 1822	3 00	4 00	1,754	100						
March 31, 1823	2 75	4 50	2,548	60						
June 30, 1823	3 00	4 00	1,888	288						
September 30, 1823	3 00	4 00	684	127						
December 31, 1823	2 50	4 00	258	116				260		
March 31, 1824	3 00	4 00	2,157	215						
June 30, 1824	3 25	4 25	2,397	215						
September 30, 1824	3 25	3 75	1,492	180						
December 31, 1824	2 50	4 50	2,330	155						
June 30, 1825	2 75	4 00	2,742	200						
September 30, 1825	2 50	3 50	767	52						
December 31, 1825	2 50	3 00	2,937	248						
March 31, 1826	2 75	3 00	1,678	138						
June 30, 1826	2 50	2 50	1,278	50						
September 30, 1826	2 50	2 50	2,019	50						
December 31, 1826	2 50	2 75	1,205	121						
March 31, 1827	3 00	4 50	2,708	55						
June 30, 1827	4 00	4 00	1,362	50						
September 30, 1827	3 00	3 50	845	80						
December 31, 1827	3 00	4 25	1,835	128						
March 31, 1828	3 50	4 75	2,684	228						
June 30, 1828	3 25	5 25	2,364	198						
September 30, 1828	2 75	3 50	2,818	205						
December 31, 1828	3 00	4 00	5,181	427						
March 31, 1829	2 75	4 50	1,611	102						
June 30, 1829	2 75	4 25	4,873	260						
September 30, 1829	2 50	3 50	3,860	258						
December 31, 1829	2 50	3 50	3,843	302						
March 31, 1830	2 25	3 50	2,093	116			2,550			
June 30, 1830	2 50	3 25	3,136	204						
September 30, 1830	2 75	3 00	2,553	234						
December 31, 1830	2 75	3 25	2,292	234						
March 31, 1831	3 50	3 75	2,495	304						
June 30, 1831	3 25	3 50	4,542	442						
September 30, 1831	3 25	3 50	1,863	259						
December 31, 1831	3 00	3 00	847	278						
December 31, 1832	3 00	2 75	712	185						
March 31, 1833	3 00	3 50	252	75						
September 30, 1833	2 75	3 00	744	103						
March 31, 1835	3 00	4 50	700	50						
June 30, 1835	3 00	7 00	514	20						
September 30, 1835	3 25	4 50	850	125						
December 31, 1839	3 00		868							
June 30, 1840	2 50	3 00	761	85						
June 30, 1841	2 75		471							
March 31, 1842	2 50		1,514							
June 30, 1842	2 25		789							
December 31, 1842	2 25		624	50					2,978	
June 30, 1876	5 00									1,626
June 30, 1877	4 00									1,500
December 31, 1878*	2 50							258		

*None exported in 1879.

71. THE FISHERIES OF SCITUATE AND DUXBURY.

SCITUATE.—Scituate, a small village, situated 26 miles southeast from Boston, at one time had a fishing fleet, of which nothing now remains larger than the small sail-boats used in gathering moss, taking lobsters, and shore-fishing. Mr. H. G. Reed, an old citizen, reports that prior to 1840 some forty sail were engaged in the mackerel fishery, but that fishery has gradually dwindled to nothing. A number of reasons are given for the entire abandonment of this industry, the principal one being an open and shallow harbor, where there is but 9 feet of water at high tide. The Government has in contemplation the building of a breakwater and the dredging of the harbor, which it much needs, in order that it may be of some use as a harbor of refuge or for commercial purposes. This the inhabitants most earnestly hope will be done. At present the small amount of fishing is done by 23 men, having 20 small sail-boats engaged in near-shore fishing. Eighteen men, with 1,200 lobster-pots and 18 dories, are engaged in taking lobsters. The fish and lobsters taken are used for home consumption, and for supplying the surrounding towns. Clams were plentiful several years since, but are now about exhausted by fishermen from the islands in the vicinity. Lobsters at one time were large and plenty, but from over-fishing they have decreased in quantity and size.

Irish moss (*Chondrus crispus*) is now the leading marine production. This is found in greater or less abundance all along the Massachusetts coast, but more abundantly about the rocks of Scituate. Prior to 1835 the small amount of that article used in this country was imported from Europe, selling from $1 to $2 a pound. In that year the late Dr. J. V. C. Smith, post physician from 1826 to 1849, and late mayor of Boston, being stationed at Rainsford Island, a few miles away, made it generally known that the moss which was so plenty was the same article that was being imported and sold at such a high price. From that time we date the commencement of this industry. Mr. Augustus Cole, of Scituate, was the first person to pay much attention to it at this place. Starting in 1853, he and his son, Charles A. Cole, have followed the business to the present time, having seen its steady growth from its infancy. We are indebted to the latter gentleman for much valuable information. With the increase of the business has followed a steady decrease in price, which in 1835 was $1 a pound. In 1853 it was only 25 cents, and gradually fell to 10 cents, at which price it remained for a number of years; the past ten years, ending with 1879, 3 to 3½ cents a pound has been paid for the crop. The average annual yield is 5,000 barrels of 90 pounds each. The past season 4,500 barrels, or 405,000 pounds, has been gathered and disposed of. The crop is always considered a sure one, and is never overworked or exhausted, since a clean glean of one year is followed the next year with the usual bountiful supply. The season of gathering begins from the 1st to the 10th of June, and lasts until about the 1st of September. During this time 120 men, with women and children, aggregating 300 hundred persons, are employed in gathering it. A barrel a day is considered an average day's work for a man.

The moss is gathered from the rocks, to which it grows to the tide level, at low water, by hand. As the tide rises, all hands take to the fleet, consisting of one hundred dories and fifty small sail-boats, using hands and a small rake, 7 inches wide, with 14 steel teeth 4½ inches long. The handle of this rake is 3 feet long. As the tide rises higher, a larger rake, 12 to 13 inches wide, with 20 to 22 steel teeth 6 inches long, and a handle 16 to 20 feet long, is used. These rakes are made only at this place, and cost $4 each. They last for about one season. With these few and crude tools the moss is torn from the rocks, thrown into the boats, and taken to the beach, where, a gravelly bed having been prepared, it is spread to the depth of 2 inches. At this time it is of a dark green color. If the weather is fair, the moss remains on the beach 24 hours; after which it

is raked up, and taken up the beach to be washed in tubs, when its color changes from dark green to red. It is once more spread out for 24 hours. The washing, spreading, and drying operations are repeated 7 times, and each time the moss loses more or less of its color, until at last it is bleached to nearly a white or straw color. Fresh water injures it, and plenty of sunshine and fair weather is necessary for a proper cure. Should the weather indicate rain, the moss is hastily raked into heaps and covered until fair weather. After curing, it is sold to dealers, packed in barrels, and shipped to the leading markets of Boston, New York, and Philadelphia, a small amount being sent to Chicago and Saint Louis. The beaches, from which the moss is mostly gathered, are named First, Second, and Third Cliff, Jericho light-house, and Sand Hill. Irish moss is used for numerous purposes; the first quality being taken by grocers and druggists for food purposes. It is also largely used for sizing. The second and inferior quality meets with a ready sale to brewers as a clarifying substance.

The fisheries of Scituate in 1879 employed 8 vessels, aggregating 70.02 tons, 170 sail boats and dories, and 1,200 lobster-traps. The total capital invested in vessels, boats, shore property and apparatus, was $21,520. The value of the marine products was $39,575, and included 1,310,000 pounds of cod, 120,000 lobsters, and 4,500 barrels of Irish moss. The number of persons employed on the vessels was 39, and on shore or in boat fisheries, 333; making a total of 372, of which number 335 were Irish, and the rest Americans.

DUXBURY.—The fisheries of Duxbury have decreased year by year since 1835. During 1879 four sail, aggregating 157.27 tons, engaged in the near home cod and mackerel fisheries. In May of the previous year a pond, by the order of the town, was stocked with herring. The result will be known about May, 1881.

Clams have always been plenty here. Formerly quite a large amount was sent from here to Boston. During 1879 thirty men followed the business for the greater part of the year, the yield being 5,000 bushels. These were sold in the neighboring towns.

The shell-fish industry, according to Mr. Goodspeed, is quite an item. Its average annual return is about $5,000. The earnings of the hands have been decreasing for five or six years, whereby the men became disheartened. A fleet of ten vessels was engaged in this industry in 1860, and, adds Mr. Goodspeed, "the prospect is that there will only be two next season" (1880). He thinks that the trawls set for ground fish, and the seines and nets for mackerel, are destroying the fisheries rapidly. He also states that the fishermen about Massachusetts Bay regard the reciprocity treaty as a very heavy burden. From the same source, we learn that the lobster fishery of 1879 was pursued by six men in open boats; each of which, on an average, stocked $300. The business is said to have declined one-half in the last five years.

A fertilizer factory was started in Duxbury in the fall of 1879 under the name of the Standard Fertilizer Company. The same company has had a factory at Bristol, Maine, since 1874. The Duxbury factory is run by a ninety horse-power engine and employs sixty men. The fertilizing compound is manufactured largely from fish products. During the fall of 1879 and the winter of 1879–'80, 1,000 tons of fish waste, the refuse skins and bones of the "boneless fish" factories, with 400 tons of menhaden chum were used. Any and all kinds of refuse fish and old bones are in demand here. Sharks, skates, and all the various fish heretofore considered worse than useless now find a ready sale, and are quietly turned to good account.

The proportional parts of the compost are about one-third each of fish-waste, phosphate, and sulphuric acid. The fish-waste is one-third menhaden chum and two-thirds fish scraps. The process of manufacture is as follows: The chum and scraps are placed in a large mixing box holding 1,500 pounds, and a revolving shaft, to which numerous spokes or paddles are attached,

keeps the mixture in motion; at the same time from 25 to 30 per cent. of sulphuric acid is added by means of a feed-pipe from a tank near by. After a thorough mixture the phosphate is added, when it is once more thoroughly mixed and then taken to the drying-room, where it remains three weeks. It is then placed in a steam dryer, and after a thorough drying the entire mixture is pulverized in the Holmes & Blanchard disintegrator. It is then packed in strong burlaps or sacks of 200 pounds each, or in barrels of 250 pounds. The demand is mainly from New England and the Southern States, the supply for the former being put up in barrels and for the latter in sacks. As the valuable qualities of these fertilizers are becoming more generally known the demand is constantly growing. During the short time this factory has been in operation it has produced 5,000 tons of various fertilizers sold under the trade names of the Standard Fertilizer, Superphosphate, and Food for Plants. Exclusive of the fertilizer factory the amount of capital invested in the fisheries of this place in 1879 was $27,580. The number of persons employed was eighty-two. The products of the fisheries were valued at about $16,000, and included 440,000 pounds of fresh mackerel, 280,000 pounds of cod, 5,000 bushels of clams, and 4,800 pounds of lobsters.

72. PLYMOUTH AND ITS FISHERIES.

PAST AND PRESENT IMPORTANCE OF THE FISHERIES.—This old historic town, with all its other honors, may well claim to have been the birthplace of the fishing industry of New England. From the landing of the Puritans, December 22, 1620, to the present time, for two hundred and sixty years, the business has been carried on to a greater or less extent. From the records of the Massachusetts Historical Society we find petitions to the General Court in 1671 for a fishing privilege to the Plymouth Colony. There is no record of the number of licenses granted to vessels until 1793, in which year 97 vessels, mostly from 30 to 60 tons, a few 80 to 100 tons, and one each 111 and 114 tons, were granted licenses for cod fishing. The first record of a bounty being paid on fish is in 1803, when 84 vessels reported a catch of 42,000 quintals, receiving $19,987.62 bounty; in 1804, 74 vessels, 37,000 quintals cod, bounty paid $18,063.62; from that date until 1815 the record is lost. From 1815 until 1867, during which time the bounty was paid, the yearly catch, number of vessels, and amount of bounty paid will be found in the review of this district. Separate licenses were granted for mackerel and cod until 1867, since which time it has been under one general fishing license, without any bounty. A large export trade was carried on for years; we find in 1805 for the three months ending December 31, 36,167 quintals of cod were exported; in 1804, same time, 23,645 quintals of cod, mostly sent to the Spanish ports on the Mediterranean. The yearly exports and value from 1803 to 1879 are given in the review of the district.

The town of Plymouth has probably more fresh-water ponds and small lakes than any other town in the State. They are said to number 365, and nearly all of them are well stocked with fresh-water fish, such as bass, red and white perch, pickerel, eels, &c. The largest of these ponds are named Herring Pond, Long Pond, Halfway Pond, White Island, Great South, Boot, and Billington Sea. They are from 1 to 3 miles long and one-half to three-quarters of a mile wide, some of them very deep, Long Pond having been sounded 120 feet. Not any fish are taken from these ponds for commercial purposes, except through the ice during the winter. The last mentioned, Billington Sea, is one and a quarter miles long and one-half to three-quarters of a mile wide. It is recorded that one of the Puritans, discovering it, and thinking he had found a sea, gave it the present name. The outlet from this lake forms a small stream called the Town Brook, which is about one mile long from the lake to its mouth in the center of the village, where it empties into the ocean. Alewives, eels, and other salt-water fish formerly went up this small stream into the

lake in immense numbers, until the erection of numerous factories has completely barred their progress with dams, as well as poisoned the water somewhat by the free use of large quantities of vitriol.

The fishing privilege of this brook is yearly leased by the authorities for a nominal sum, the lessee being obliged to place 10,000 alewives in the headwaters each spring, usually about May 1. The brook has no fishways, and the fish are carried in tanks past the dams. The lessee has the sole right to take fish from the brook, though the privilege is not worth much, only about 100 barrels of alewives being the annual catch. Eels were formerly so plenty as to do much damage to the dams, which had to be sheathed with tin, in many cases. The small, iron turbine water-wheels have often been choked and stopped by eels, and large quantities were caught in traps, until the passage of a law in 1877 preventing their catch, except by spearing, or in pots made of withes.

But little can be said of the fishing industry at the present time. In company with most of the old fishing towns of Massachusetts, with the advent of railroads came numerous new industries, the cordage, shoe, thread, nail, print, and other factories, drawing yearly from those engaged in the fisheries, so that the number of fishing vessels shows a yearly decrease, until against seventy vessels from this town in 1839, we find but thirteen in 1879.

Lobsters are taken in considerable numbers, but the catch of late years shows a decrease in numbers and size. They are taken near shore, not over 1½ miles out, from Cut River on the north to Sandwich on the south. One-half of the catch is marketed at home, supplying the near towns, and one-half sold to smacks from Boston, New York, and New Haven. Not much attention is paid to the law as to size. About all the lobsters found in the traps are saved, those under size being sold to the smacks from out of the State, and only those of the legal length are landed or sent to Boston.

Clams were the chief support of the Puritans during their first winter here, and probably prevented the starving of the infant colony. The daily prayer of the devout Brewster was that they might "suck of the abundance of the seas, and of the treasures hid in the sands." The supply continues good, and clam-digging gives employment at the present time to thirty men during half of the year.

Boneless fish is cut to a small extent, 250,000 pounds the past year. A small amount of fish is exported via Boston and New York, but not any direct from here since 1878. A small amount of cooperage, half and quarter barrels and kits, to the amount of $15,000 worth was manufactured during 1879; one-fourth of this cooperage went to New York and Philadelphia, the rest to Boston and near home towns.

It is an interesting historic fact that to the fisheries of the old Plymouth colony we owe the birth of the free-school system of Massachusetts, the Colony Court in 1663 making the following proposition:

"It is proposed by the court unto the several townships in this jurisdiction, as a thing that they ought to take into serious consideration, that some course may be taken in every town, that there may be a schoolmaster set up to train children to reading and writing."

In 1670 "the court did freely give and grant all such profits as might or should accrue annually to the colony, for fishing with nets or seines, at Cape Cod, for mackerel, bass, or herring, to be improved for and towards a *free school*, in some town of this jurisdiction, for the training up of youth in literature for the good and benefit of posterity, provided a beginning be made within one year after said grant."

The school was at once established at Plymouth, and until 1677 was supported from the proceeds of the Cape fishery. From 1677 until the union of Massachusetts with Plymouth Colony, in 1692, the proceeds of the fishery revenue were divided among several towns, to be used for the same object; since 1692 the fisheries have been free.*

In 1879 the fisheries of Plymouth employed one hundred and eighty-two men, and a capital of about $62,000. The value of the various fishery products was about $53,000. These products included 9,128 quintals of dry cod, 357,500 lobsters, 5,000 bushels of clams, and 4,564 gallons of fish oil. The fishing fleet consisted of ten vessels, aggregating 649.57 tons, one idle vessel, 54.58 tons, and fifty-five boats in the shore fisheries.

H.—THE DISTRICT OF BARNSTABLE.

73. REVIEW OF THE FISHERIES OF CAPE COD.

CAPE COD AND ITS FISHERIES.—The county of Barnstable, which comprises the customs district of the same name, includes all of Cape Cod from Sandwich to Provincetown and Wood's Holl. This cape has a coast line nearly 150 miles in extent, with few good harbors, and most of these are difficult to enter. The harbor at Provincetown, however, is an excellent one, easy of entrance, and well sheltered, and is much frequented by coasting and fishing vessels.

Most of the towns on Cape Cod are more or less interested in the boat fisheries, though the vessel fisheries are confined to the leading ports, of which Provincetown is the most important. The entire fleet of vessels numbers 196 sail, of 12,489.19 tons. Of this number 171 vessels, of 10,355.68 tons, are employed in the capture of cod, mackerel, or other food-fish; 2 vessels, of 123.69 tons, are engaged throughout the season in the oyster-carrying trade; and 20 vessels, of 1,938.92 tons, follow the whale fishery. The fleet of whalers is owned at Provincetown. These vessels are of the smaller class, and cruise exclusively in the Atlantic Ocean. The number owned here during the past 40 years, has ranged from 10 to 53 sail; the latter number was in 1868; in 1850 the fleet was reduced to 10 sail.

The shore fisheries of Cape Cod employ 1,100 boats, 2,262 gill-nets, 32 haul-seines, 44 weirs or pounds, and 3,000 lobster and eel traps. The catch of the shore fishermen includes a great variety of edible fish, besides numerous species used only for manure. Lobster-catching is carried on to some extent, but is not as profitable as in districts farther north. Clams were formerly taken in much larger quantities than at present. The oyster business was once an important element in the fisheries of Cape Cod, but is now comparatively unimportant, except as regards the carrying-trade, which gives employment to mackerel vessels during the winter season. In the winter of 1879–'80 the number of Cape Cod schooners in this business was forty-six, owned at Wellfleet and Provincetown. Ingersoll reports the following facts concerning this fleet:

"This list of forty-six schooners comprises, I think, the whole of the Cape oyster fleet; and there are few vessels engaged outside of these ports. They were noted in the old days, as now, for their

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* The custom-house records for the past one hundred years and over are in a fine state of preservation, and quite complete; are mostly large calf-bound books, such as we do not often see of that early date. For much information from them and otherwise we are indebted to Samuel H. Doten, collector; Charles O. Churchill, deputy collector; George Harlow, and J. R. Atwood, fish merchants.

swiftness in speed and firmness of structure, and were the origin and prototypes of the famous Boston clipper ships. The original cost of these fine vessels was, on the average, about $7,000; now they are not worth over $4,000 each. In summer they go on mackerel-fishing voyages, which occupy a little more than half of the year. In the winter and spring they carry oysters, varying it with frequent coasting trips. Four voyages after oysters annually would probably be a fair average, and not more than a third of the vessels' yearly receipts, as a rule, will be derived from this source. They are commanded by captains of experience, and go back and forth quickly, safely, and profitably. Capt. Jesse Freeman, now one of the leading fish merchants of the village, told me that he had sailed between the Chesapeake and northern ports 316 times before he was forty years old, that is, 158 voyages. His opinion was that no cargo wore upon a vessel less (others say the opposite), and it was usually of much profit to the owners. In the spring, oysters for bedding are brought cheaper than those designed for market in winter. The crew of an oyster vessel usually consists of two (often three) men before the mast, with a cook, mate, and captain. One-third (as a rule), sometimes one-half, of the freight-money goes to the owners, and the remainder to pay the men and furnish food. The wages of a mate in 1879 were $30 a month; of a cook, $25; and of a seaman, $15 to $16. Food for a voyage costs from $40 to $50. In addition to his share, the owners give the captain $15 a month."

The total capital invested in this district in all branches of the fishing industry is $1,355,278, and the value of the product is $1,051,619. The number of persons employed is 4,004.

STATISTICAL SUMMATION FOR 1879.—The following statements give in detail the extent of the fishing interests of Barnstable district:

Summary statement of persons employed and capital invested.

Persons employed.	Number.	Capital invested.	Amount.
Number of vessel-fishermen	2,297	Capital in vessels and boats	$960,550
Number of boat fishermen	1,507	Capital in nets and traps	140,828
Number of curers, packers, fitters, &c	184	Other fixed and circulating capital	a253,900
Number of factory hands	16	Total	1,355,278
Total	4,004		

a Cash capital, $100,000, wharves, shorehouses, and fixtures, $108,000; factory buildings and apparatus, $45,900.

Detailed statement of capital invested in vessels, boats, nets, and traps.

Vessels and boats.	No.	Tonnage.	Value.	Value of gear, exclusive of boats and nets.	Value of outfit.	Total value.	Nets and traps.	No.	Value.
Vessels.							*Nets.*		
In food-fish fishery:							Gill-nets:		
Active	171	10,355.68	$434,550	$20,985	$239,150	$694,685	In vessel fisheries	484	$5,928
Idle	3	70.90	2,400			2,400	In boat fisheries	2,262	26,930
In oyster fishery	2	123.69	6,000		200	6,200	Purse-seines:		
In whale fishery	20	1,938.92	68,800		*66,350	135,150	In vessel fisheries	82	44,920
Total	196	12,489.19	511,750	20,985	305,700	838,435	Haul-seines:		
Boats.							In boat fisheries	32	6,400
In vessel fisheries	778		33,155			33,155	Total	2,869	84,178
In shore fisheries	1,100		69,650	6,300	13,010	88,960	*Traps.*		
Total	1,878		102,805	6,300	13,010	122,115	Weirs, &c	44	53,650
							Lobster and eel pots	3,000	3,000
							Total	3,044	56,650

* Includes gear.

Detailed statement of the quantities and value of the products.

Products specified.	Pounds, fresh.	Pounds, prepared.	Bulk.	Value, prepared.
Grand total				$1,051,619
Fresh fish.				
Alewives	897,495			4,520
Bass, sea	12,300			738
Bass, striped	124,940			12,494
Bluefish	3,264,014			97,921
Cod	3,225,104			48,376
Cunners	4,000			20
Cusk	3,500			25
Eels	95,993			4,800
Flounders	116,169			1,743
Haddock	738,000			9,815
Hake	52,869			317
Halibut	10,000			350
Herring	541,830			2,709
Mackerel	1,851,225			24,621
Mackerel, Spanish	60			9
Menhaden	275,089			918
Perch	17,498			525
Pollock	16,000			64
Salmon	20			3
Scup	625,230			18,757
Shad	58,857			2,943
Squeteague	32,175			1,126
Sturgeon	2,000			60
Swordfish	21,750			653
Tautog	74,849			2,620
Mixed fish	500,000			2,500
Total	12,560,976			238,627
Dry fish.				
Cod	24,029,940	9,611,979		346,031
Cusk	23,376	11,688		316
Haddock	115,000	43,518		870
Hake	345,600	155,538		2,489
Pollock	265,300	108,795		1,850
Total	24,779,216	9,931,518		351,556
Pickled fish.				
Alewives	232,800	186,250		3,725
Bluefish	14,495	8,920		223
Herring	225,000	180,000		2,700
Mackerel	13,270,500	8,847,000		254,351
Swordfish	52,500	30,000		975
Mixed fish	13,500	9,000		225
Total	13,808,795	9,261,170		262,199
Smoked fish.				
Alewives	20,000	12,000		300
Halibut	54,700	13,675		1,094
Total	74,700	25,675		1,394
Shell fish.				
Lobsters	211,230			7,745
Oysters			3,400 bushels	a 9,750
Clams:				4,375
For food			26,000 bushels	13,000
For bait			6,773 bushels	2,420
Quahaugs and sea-clams			5,250 bushels	2,625
Scallops			1,028 gallons	514
Total				40,429

a Enhancement on southern oysters.

Detailed statement of the quantities and values of the products—Continued.

Products specified.	Pounds, fresh.	Pounds, prepared.	Bulk.	Value, prepared.
Miscellaneous.				
Fish oil			52,150 gallons	$21,805
Fish guano			300 tons	2,200
Fish spawn			75 barrels	243
Fish sounds (dried)		2,300		2,000
Marine salt			136 tons	1,290
Seaweed			1,400 tons	1,400
Total				28,938
Products of whale fishery.				
Sperm oil			110,817 gallons	93,640
Whale oil			84,507 gallons	36,447
Whalebone			9,250 pounds	1,389
Total				128,476

The following statement, by Mr. F. B. Goss, collector of customs, shows the extent of the vessel fisheries of the district of Barnstable, for the year ending December 31, 1881:

Where fishing.*	Number of vessels.	Tons.	Products.	Amount.	Value.
Grand Bank	46	4,061.43	Codfish ..... cwt.	90,844	$352,203
Gulf Saint Lawrence	12	747.86	Fish oil ..... galls.	59,665	21,502
American waters	12	512.16			
American waters	58	4,217.19	Mackerel ..... bbls.	62,246	363,616
North Atlantic Ocean	18	1,726.97	Sperm oil ..... galls.	57,109	46,141
Whaling grounds, No. 90			Whale oil ..... galls.	52,218	20,954
Total	146	11,265.61			804,416

* Within three miles of the Canada shore, none.

RECAPITULATION FOR 1881.

	Vessels.	Tons.
Cod fisheries, Grand Bank	46	4,061.43
Cod fisheries, Gulf Saint Lawrence	12	747.86
Cod fisheries, American waters	12	512.16
Mackerel fisheries, American waters	58	4,217.19
Whale fisheries, North Atlantic Ocean	18	1,726.97
Total	146	11,265.61

74. PROVINCETOWN AND ITS FISHERIES.

GENERAL DESCRIPTION.—Provincetown is the leading fishing port in Barnstable County, as well as one of the most important in the United States. The town is located at the extremity of Cape Cod, and is almost surrounded by water. The western coast line is deeply indented, forming the shore of one of the finest harbors on the Atlantic coast. The houses are built near the water, occupying a section of the town extending along the shore of the harbor for nearly a couple of miles. Between the dwellings and the sea, eastward, lie the great "sand dunes," which form a peculiar feature of this portion of Massachusetts.

In the following account of the present fisheries of Provincetown we shall employ almost exclusively the material furnished by Capt. N. E. Atwood, a retired fisherman of the town, well known for his extended and accurate information on the fisheries, also for his influence on the fishery legislation of the State and his scientific observations upon American fishes and other marine animals.

Nearly every branch of the fisheries peculiar to the northern waters is now or has recently been carried on by the fishermen of Provincetown. Those fisheries which are of sufficient importance to claim attention in this connection are as follows: 1. The offshore cod fishery; 2. The longshore and winter cod fishery; 3. The offshore mackerel fishery; 4. The inshore mackerel fishery with gill-nets; 5. The bluefish fishery with gill-nets; 6. The hake fishery; 7. The lobster fishery; 8. The whale fishery.

THE FISHERY FOR COD.—Supreme in importance is the offshore cod fishery, which has always been carried on at Provincetown with as much zeal as has the mackerel fishery at Wellfleet. Sixty-three vessels engaged in this cod fishery in 1878, each making but one voyage during the season. About four-fifths of the vessels visited the Grand Bank. The majority sailed in the month of May and returned in September or October. Although several vessels did not get full fares of fish, the amount of cod brought in slightly exceeded 75,000 quintals, and of oil a thousand barrels. Four men lost their lives in this fishery during the year. In 1879, with about fifty vessels, the catch amounted to a little less than 68,000 quintals of cod.

Besides the above vessels engaged in the Bank and Gulf of Saint Lawrence cod fishery, a few vessels fish along the coast for cod, selling the fish fresh in Boston, when it is found best to do so; at other times salting them on board and selling them after arriving in some port, either Provincetown, Boston, or Gloucester, as most convenient. The fishermen sell their fish as soon as they can after being salted, as the sooner they sell the more the fish will weigh. They sell them to parties who dry them for market, so that it is not possible to know the number of quintals they get during the season. Besides cod, they catch halibut, haddock, hake, &c. Their fishing is of a varied character, as they sometimes take their fish to market fresh, and sometimes salt them.

Besides the eleven vessels engaged in the New England coast cod fishery, some thirteen small vessels, or boats of less than 20 tons burden, are a part of the time engaged in miscellaneous fisheries with hook, line, and nets for anything they can get, when fish come into the bay. A great part of the time some of them do nothing in the way of fishing, and altogether they make but a small profit.

Cod come into Provincetown Bay and along the coast late in autumn, and remain through the winter and early spring, at which times the fishermen engage in catching them. It is the only fishery carried on in winter, and a considerable number of men are engaged in it. The fishing is carried on from the shore in dories, commencing in December, usually from the middle until the last of that month. The fishery has been carried on at Provincetown many years. The mode of fishing from the beginning was altogether with hand-lines. The trawl-line was not in use here until the winter of 1858, when it was first introduced. Since that time until now the trawl-line fishing has been in general use for cod and haddock.

In 1880 the fishermen commenced their winter cod-fishing about the middle of December, but few were taken. The fishery proved a failure. The fish were sold fresh and sent to Boston, New York, and other markets. About one hundred and forty fishermen were employed. The whole catch during the winter amounted to 496,000 pounds, which, with about 1,000 gallons of oil, was valued at nearly $12,000.

THE MACKEREL FISHERY.—In 1870 and 1871 no mackerel vessels from Provincetown were

sent to the Gulf of Saint Lawrence. All the vessels engaged in this fishery cruised on our own coast. In 1879, also, none of the vessels entered the Gulf. But one firm, the Central Wharf Company, had vessels in the mackerel fishery during that year, and the results were not all that could be desired.

For many years the Provincetown fishermen have been engaged in setting gill-nets in the harbor and bay late in autumn to catch the mackerel as the last schools are passing off the coast on their way to their winter quarters. November is the best month, and it is then that most of them are caught. In some years they have been taken in large quantities as late as the middle of December. They will not bite at the hook, neither do they school, and the seine and hook fishermen cannot catch them. In some falls they come in, school after school, for several weeks. When one school is passing we may have two, three, or more nights' good fishing, after which we may have to wait a week or two weeks or longer before another school will come along. In this way some falls our fishermen do a good business for the time they are engaged, while in other falls the mackerel pass Cape Cod wide out from the coast, and do not come into the bay in any quantity. Only a few straggling specimens are caught. The fishermen using nets do not get enough to pay for the wear and tear and loss of nets.

When this fishery commences many of the fishermen are at home, after having made their voyages to the Grand Bank or elsewhere. Many of them have a few mackerel nets and engage in the fishery. A large number of men are employed while these fish are passing. The following statement shows the number of men employed and value of the fish caught annually for four years:

Year.	Men.	Gross stock.
1874	153	$13,870
1875	127	21,950
1876	188	7,700
1877	184	1,840

In 1878 very few caught; not more than there were the year before. We have no account of the number caught. It will be seen by the foregoing figures that in some falls, like 1877 and 1878, the catch is merely nothing, while in others it proves to be a profitable business for a few weeks while the mackerel are passing.

About one hundred and eighty men were engaged in this fishery last fall (1879), and those having a good stock of nets made a good catch, while others having but few nets did the best they could at that time, as there was no other fishery that would pay them anything.

In the fall of 1879 a large quantity of mackerel was taken in nets for a short time. The most of them were small. They were shipped to Boston, New York, and Philadelphia, and sold fresh at an average price of about 3 cents apiece. Besides the smaller ones a few extra large ones were caught. The most of them were salted and sold at $30 per barrel. The total stock amounted to not less than $22,000.

In the fall of 1880 the fishery was engaged in by about one hundred and fifty men, but it proved a failure. The total stock was not more than $7,500.

FISHERIES FOR BLUEFISH AND HAKE.—The bluefish gill-net fishery has never been carried on very extensively at Provincetown. About thirty-five men, with twelve nets each, engage in it during summer. About $4,000 worth of fish are taken annually.

In the fall of 1880, and in some previous years, forty or fifty men who were engaged in the Bank cod-fishery commenced, after their return, a fishery for hake. They employed dories, and

fished at a short distance from land. In 1880 they secured about 1,000 quintals of fish and 600 pounds of sounds, the total value of which was a little less than $2,000.

THE LOBSTER FISHERY.—Lobsters some ten years ago were abundant, and during the summer a large number of fishermen engaged in this fishery. It was a good and profitable employment for our fishermen from the middle of June to September. They have since become very scarce, so that the fishery will not pay, and only a few old men that have nothing better to do engage in it. In 1880 eight men were employed and averaged only about $60, making a gross stock of $480.

THE WHALE FISHERY.—Of the early whale voyages made from Provincetown there is no record. From the best information we can get we are led to believe that many years ago there were vessels fitted out from this place that made voyages to the Gulf of Saint Lawrence and coast of Labrador and thence northward for right whale. We have been informed that some vessels belonging here made voyages for sperm whale; if so, we have no record of the number of vessels so engaged, the length of their voyages, their cruising grounds, or the quantity of oil taken.

In 1820 five schooners sailed from this port to engage in the sperm-whale fishery. They went directly to the Azores and made their cruising ground near those islands, and thence to the northwest. They all arrived home in the autumn; the result of their voyages proved better than vessels that were engaged in the cod fisheries that season, so that in 1821 the whaling fleet was increased to twelve vessels. All of them went direct to the Azores and cruised in the vicinity of those islands in spring and early part of the summer, after which they went out northwest of the islands some 100 to 200 miles and made that their cruising ground the rest of the season. They met with fair success and all returned home in the fall. The following year (1822) the whaling fleet was increased to eighteen vessels. All went to the Azores, making their cruising ground the same as the year before. Most of their voyages proved a failure, owing to the small quantity of oil brought in and the low price of sperm oil. Nearly all of the vessels were withdrawn from the business to be employed in the cod fisheries. In the spring of 1823 the brig Ardent, Captain Soper, sailed from here on a whaling voyage to the Azores. On her passage home in the fall she was wrecked. The crew were fourteen in number, and many of them died of hunger and exposure. The survivors, after living on the wreck 26 days, were taken off by the British ship Lord Sidmouth on her passage from New York to England. Captain Soper and three of his crew returned home via England.

After this the sperm-whale voyages were generally discontinued from this port for a number of years, though occasionally one or two vessels made short voyages. In the spring of 1830 two schooners sailed from this port; schooner Fair Lady, Captain Atkins, and schooner Vesta, Captain Holmes, made voyages to the Azores for sperm whales. They cruised in the vicinity of the islands through the season, and returning home in the fall, the Fair Lady with 300 barrels and Vester with 160 barrels sperm oil. In the spring of 1833 the brig Imogene (Smalley, master) sailed from this port for the Indian Ocean. She returned in December, 1834, after an unsuccessful voyage. The above-named vessel sailed again in April, 1835 (Atkins, master), to cruise in the Atlantic; she returned home in the fall after a successful voyage. The following year (1836) the Imogene and schooner Louisa sailed from this port on a whaling voyage. These two vessels made another voyage in 1837, after which the Louisa was withdrawn. The Imogene continued in the business the two following years, 1838 and 1839. After her return home in the fall she was wrecked in Provincetown Harbor in December, 1839. In all her Atlantic whaling voyages she was successful. In the spring of 1840 three brigs sailed from this port—Franklin, Captain Soper; Fairy, Captain Genn; and Phenix, Captain Small. They all returned in the fall with a large catch of sperm oil. The Phenix when four months and eighteen days from home was all full having taken 700 barrels

of sperm oil. The success of the vessels was an inducement for others to engage in the sperm-whale fishery, so that a few years after we sent out a large number of vessels.

In 1855 the whaling fleet had increased to fifty-four vessels engaged in the Atlantic sperm-whale fishery. We have had but two vessels from this port who have made voyages in the Pacific for whales. Schooner Mary E. Nason, Capt. Harvey Sparks, sailed in the summer of 1868 and returned in 1871. Schooner Gage H. Phillips, Capt. John J. Cook, made her voyage after the Mary E. Nason. Neither of these voyages proved a success, and the Pacific whaling has been abandoned. Of late years the whaling fleet has been less in number. In 1879 twenty vessels belonging here were engaged in the Atlantic whale fishery. In 1880 the whaling fleet numbered twenty sail that cruised in the Atlantic for sperm and other whales. The fleet in 1881 numbered eighteen vessels that took 57,109 gallons of sperm oil, worth $46,141, and 52,218 gallons of whale oil, valued at $20,954.

Early in March, 1880, there came into Provincetown Bay and harbor immense quantities of herring and shrimps. They were followed by a great number of finback whales, which were here most of the time in greater or less numbers until about the middle of May, when they all left. During the time they were here many of them were killed with bomb lances. They sank when killed and remained at the bottom some two or three days. They then came up to the top of the water, and as they were liable to come up in the night or during rugged weather, when the whalemen were not there to take them, many of them drifted out to sea and were lost. Thirty-eight were brought in and landed at Jonathan Cook's oil works on Long Point. The blubber was taken off and the oil extracted from it in the above-named factory. Two others brought in were sold to parties who took one of them to Boston and the other to New York, where they were exhibited, making forty whales in all saved. Early in June immense quantities of sand eels (*Ammodytes*) came in our harbor and bay and remained here several days. About the 10th of June there appeared plenty of whales, feeding on the sand eels. They were again attacked by our men, when a number of them were killed in a few days, of which ten were saved and landed at the oil works. Probably as many more that were not killed outright received their death wounds and went out of the bay and soon after died and were lost. The forty-eight whales delivered at the oil works yielded 950 barrels of oil, sold at an average price of 40 cents per gallon.

When the first whales were killed it was supposed the whalebone in their mouths was worthless. It was not saved. Subsequently some was saved and sold at 15 cents per pound. The average quantity of bone in each whale is about 250 pounds. No whales have come in of late. Our men are still anxiously looking for another school, hoping they will come again and give them another benefit.

In the spring of 1881 the whales came into the bay again, but not in so large numbers. Fifteen were killed, which furnished 300 barrels of oil.

THE PROVINCETOWN FISHERIES, 1860 TO 1870.—In regard to the condition of the fisheries at the opening of this decade, we cannot do better than to quote a few sentences from Freeman, who, in his History of Cape Cod, written in 1862, says:

"In 1860 Provincetown might be pronounced beyond contradiction one of the most enterprising and flourishing towns in the country. The fisheries now, as ever, command much attention, and employ a great number of men and a very large amount of capital. These fisheries, it may be said, train a large number of the most experienced and intrepid mariners in the world.

"As the abolition of the bounty on salt caused the decline of that branch of domestic manufacture, so the often threatened abolition of the fishing bounties may yet cause the decline and even general abandonment of this branch of industry."

In 1862, from some cause or other, the number of vessels in the cod fishery dropped to about seventy-six, while the aggregate of the catch was approximately 65,000 quintals. Five years later the fleet had again increased, the number of vessels employed being ninety-one. The crews aggregated the very large number of nine hundred and eighty-eight men. In regard to the size of the fleet Captain Atwood remarks:

"The list of cod-fishing vessels sailing from this port in 1867 to the Grand Bank and Gulf of Saint Lawrence was the largest that has been sent out *in any one year* either before or since."

Seventy-eight thousand five hundred quintals of cod were brought in, in salting which about 14,000 hogsheads of salt had been used. The bait used in the cod fishery at this period was entirely of clams, salted. The amount used in 1867 was about 4,098 barrels. Oil to the amount of 1,583 barrels was produced on board.

The vessels engaged in the cod fishery also brought in a considerable amount of halibut. In 1867 the quantity of this species taken by the fleet was 15,156 quintals, or nearly one-fifth the catch of cod. In 1868 five of the vessels carried out ice, with the intent to preserve the halibut and bring them into market fresh; but the experiment, from some cause or other, proved a failure. Each made several trips during the season.

Between 1867 and 1869 the fleet suffered a decrease of nine vessels, the number employed in the latter year being eighty-two, with a tonnage of 5,409 tons, and carrying eight hundred and ninety-four fishermen. They went both to the Grand Bank of Newfoundland and to the Gulf of Saint Lawrence, as in former years, seventy-one visiting the former and eleven the latter grounds. Although the number of vessels was less than in 1867, the cod-fishing was considerably better, and the catch exceeded that of the two previous years, the amount being about 80,457 quintals. Halibut, however, appear to have been quite scarce, or else the fishermen were discouraged by the unsuccessful efforts of the preceding year in bringing them fresh to market, for the catch was only 7,653 quintals, or less than one-tenth the amount of cod. About 1,283 barrels of crude cod oil were brought in. In catching and curing the fish 3,262 barrels of bait and 13,321 hogsheads of salt were expended. The only loss of life this year was from the schooner John Tyler, from which, while riding at anchor on the bank in a gale, the captain and three of the crew were washed overboard and drowned. The Gloucester Telegraph for January 19, 1870, contains the following item bearing on the cod fishery:

"The cost of outfits in the spring was high, so that the fishermen on the average will make small pay, and will find that this fishing the last season has not been a paying business. About half the fish are still on hand."

According to the Provincetown Advocate the mackerel fishery in 1869 employed seventy vessels and about eight hundred and forty men.

The following paragraph, from the Provincetown Advocate, gives some insight into the condition of the town and the character of the people at the close of this decade:

"Provincetown is rich in fishing vessels as well as in coasters. About three thousand men are engaged. They are all plucky, resolute sailors, of good morals and considerable education. Intemperance does not seem to have crept into Provincetown as into some other of our coast villages. Even when the fishermen return in the fall there is but little drunkenness. One-third of the town's population of 6,000 are Portuguese, and these make remarkably good sailors. A large number of the fishermen who ship in Provincetown vessels are from other parts of the cape, but are generally Americans or Portuguese."

75. TRURO AND WELLFLEET.

THE FISHERIES OF TRURO AND SOUTH TRURO.—Truro Township occupies a portion of Cape Cod lying between Wellfleet and Provincetown, extending about 10 miles north and south. The width of the cape at this part varies from about 1 mile to 3 miles. Pamet harbor, situated in the southeastern section of the town, is the only inlet from the waters of the bay, if we exclude the one partially forming the boundary between this town and Provincetown. In former years it furnished a safe and commodious haven for vessels, but at present it is choked with sand and rendered useless.

The town contains three small villages, namely, North Truro, Truro, and South Truro. North Truro is a compact village, removed a considerable distance from the other two, and its fisheries, therefore, will be considered separately.

Truro is a somewhat scattered village lying on the north side of Pamet harbor. It does not seem to be largely dependent upon the fisheries. Ten men are engaged in spring and fall in setting mackerel gill-nets. The spring season opens about the 1st of June and lasts a month; the fall fishing begins about the middle of November and also lasts a month. Each man uses about ten nets, which are made from old menhaden nets and are of but little value.

In spring and in fall five men engage in trawling codfish on the ocean side of the cape. They own two trawls, each about 250 fathoms long, and worth $6. When the men catch more fish than they themselves can consume, they sell the surplus fresh in the village or send it salted to Boston.

Every spring and fall cod fishing with hook and line is carried on in the bay. In the fall of 1878 twenty-five men were employed in this fishery; in the spring of 1879, twenty men. In 1879 two men were engaged in setting lobster pots. They owned 10 pots, which they set both on the ocean side of the cape and in the bay. They caught about $100 worth of lobsters, the majority of which they sold in the neighborhood. A few were sold to a Provincetown smack which visited Truro at irregular intervals. Very few bluefish nets are now in use in Truro. No other branches of the fisheries are pursued.

Time has wrought many changes in the condition of Truro and of its fisheries. The fine fleet which anchored in Pamet harbor has been scattered, and the industry which raised the town to importance and brought wealth to many families has dwindled into insignificance.

THE FISHERIES OF NORTH TRURO.—North Truro, or Pond Village, as it is commonly called, is situated in the northwestern part of Truro Township, on Cape Cod Bay. The principal portion of the village is built upon the northern bank of a small fresh-water pond, and on a cross-road at its eastern extremity. The pond formerly formed a small harbor, communicating with the waters of the bay, but was closed by a dike at the time of the construction of the railway. On the low beach, outside this dike, stand the storehouses of the fishermen, about 15 in number.

The principal fisheries engaged in by the fishermen of North Truro are for bluefish, cod, mackerel, menhaden, and lobsters. A few clams are dug, and three or four men occupy themselves in manufacturing dogfish oil. The bluefish gill-net fishery is the leading pursuit. About fifteen men are engaged in it, each employing ten or twelve nets. Fishing is prosecuted from the 1st of July until the middle of October. During the season of 1879 about 40,000 pounds of fish were caught. They are invariably packed in ice and sent by rail to Boston or New York, consigned to agents, to whom a commission of 5 per cent. is paid.

Codfishing with trawls is carried on in winter on the ocean side of the cape, and with hook and line in spring and fall in the bay. In winter only three or four men are engaged in trawling, for it is an arduous and dangerous employment, yielding scanty and uncertain profits. They ven-

ture forth only on those days when the sea is calm. The codfish which are taken are salted and sold in the village.

In the cod fishery carried on in spring and fall twelve or fifteen men participate. The spring season opens about the 15th of April and lasts two months. In fall, fishing begins about the middle of October and is continued for about a month. In the spring of 1879—an unfavorable season—the average daily catch of each fisherman was about 10 fish, while 50 was about the average number in the fall of 1878. All cod taken in this fishery are salted, and usually sold in the village at a price seldom varying widely from $3 per quintal.

The spring mackerel fishery, engaged in by nine men, begins early in May, and continues for one month. In fall, twenty-two men fish for mackerel during a month or six weeks, beginning at any date between the 20th of October and the 10th of November. Somewhat less than 150 nets are employed in spring, but in fall about 300. In the spring of 1879 each fisherman captured from 120 to 600 fish, while in the preceding year not more than 700 were taken by each man during both seasons. The mackerel are packed in ice and sent principally to New York.

Four or five menhaden nets are owned in the village, but have not been used for three or four years. They were formerly employed in capturing bait for Gloucester vessels.

There are only two fishermen at North Truro who make a business of lobster-fishing, each of whom owns about 50 pots. One fishes from April to September, the other from May to the middle of July. The lobsters are sold both in Boston and New York and are usually shipped by rail, but sometimes in smacks which come from Provincetown at irregular intervals. In 1879 about 7 cents apiece was received for them; in 1878, 8 cents.

The four men engaged in extracting dogfish oil produce about 350 or 400 gallons annually as the result of their combined industry. The oil is sold in Provincetown.

At the time of the greatest prosperity of the village, about thirty years ago, there were twelve or fourteen vessels hailing from North Truro. They were all cod vessels, and made regular trips to the banks. Each crew consisted of four men, who shipped on shares, and a number of boys. In winter the vessels were laid up in Pamet harbor in Truro. With the decline of the business they were sold one by one, and joined the fleets of Wellfleet and Provincetown. The Volante and the Alterato (?) were among the last that hailed from North Truro.

When the vessel fishery declined, the inshore grounds were still well supplied with fish, and the waters adjacent to North Truro swarmed with boats of all descriptions. It was not unusual, according to Mr. Harvey Collins, looking from the beach, to see three hundred or four hundred boats filled with men and boys busily engaged with hook and line. Many of these boats belonged at North Truro, but perhaps the larger proportion came from Provincetown and Truro. With the advent of bluefish and the introduction of gill-nets the hook-and-line fishing gradually decreased, until it assumed its present limited proportions.

Prior to ten years ago many New London smacks came to North Truro and the vicinity to fish for lobsters. In those days the "hoop-pot" was in general use. The North Truro fishermen usually fished from boats with one or two pots, but the New London men attached buoys to their pots and set a great many in all directions. The new pots are much more destructive than were the old ones, but nevertheless lobsters were so much more abundant when the latter were in use that many more were taken in a season than now. Fifteen or twenty years ago it was not unusual to sell a boat-load of lobsters for 1 cent apiece.

About thirty years ago a breakwater was built on the outer bar, opposite the village. It was triangular in section and ballasted below with rocks. Unfortunately, however, it lasted only two or three years, being speedily destroyed by ship-worms.

THE GENERAL FISHERIES OF WELLFLEET.—Wellfleet, the second fishing town in importance in Barnstable County, is situated about half way between the "elbow" and extremity of Cape Cod. The village stands upon high ground at the head of a beautiful and commodious harbor, which opens toward the south, and is protected on the east by a number of islands, on the most southerly of which stands Billingsgate light. The wharves, which are three in number, are well built and in a good state of preservation.

The fisheries engaged in are: 1. The offshore mackerel fishery. 2. The oyster fishery. 3. The weir fishery. 4. The clam fishery. 5. The mackerel fishery with gill-nets. 6. The alewife fishery. The offshore cod fishery has been engaged in at different times, but has been abandoned after a short trial on account of the poor facilities which Wellfleet offers, and the lateness of the return of the fleet from the winter oyster fishery.

In 1879, the fleet of Wellfleet fishing-vessels comprised thirty schooners, one of them a three-masted vessel; the extremes of tonnage being, respectively, 37.12 and 151.65 tons. The average crew is fourteen men. In 1879 all of these vessels were engaged in mackerel catching from May to November, and, with one exception, all used purse-seines. They followed the mackerel from Cape Hatteras northward, fishing at the latter part of the season off Mount Desert, Maine. One schooner, the smallest of the fleet, used hand-lines, and fished on Nantucket Shoals during that year. From November to May the vessels are employed in carrying oysters from Virginia to Boston market. Five-sixths, or perhaps even a larger proportion, of the fleet are employed in this manner in the winter. A few enter the merchant-service at the close of the mackerel fishery, and many of those engaged in the oyster trade make two or three trips to Jamaica and other West Indian ports during the winter.

Five weirs are located within the limits of Wellfleet Township, but one of them is owned in Eastham, and will be mentioned below under that town. Of the four remaining weirs, three are erected near each other, off Horse Island, at the southeastern part of the harbor, and the fourth almost exactly on the boundary between Wellfleet and Eastham. They are all "flat" weirs, constructed of poles and laths.

From 100 to 150 gill-nets are set in spring and in fall for mackerel. They are owned by ten or fifteen men, the average number owned by any one man being ten. These nets are not allowed to drift, but are anchored at one extremity.

The Wellfleet Herring River has its source in a chain of lakes at the north of the village, and opens into the harbor at its extreme northwestern section. This river, formerly the property of a citizen, was given to the town on condition that it should be kept in good order. It is leased annually to the two highest bidders. Fishing is carried on only on Mondays, Wednesdays, and Fridays, according to a law made in 1773.

The hard clam or quahaug fishery gives employment to five men during a large part of the year. They do not spend their whole time, however, in this fishery. Most of the raking is done on the west side of the bay, where the water is not more than 8 feet deep at ebb-tide.

In 1879, 16,947 barrels of mackerel were inspected in Wellfleet. During the same year about 500,000 pounds of fish were sent to market from the weirs. The Herring River produces about 25,000 fish annually. About 1,800 bushels of quahaugs have been taken annually for a number of years. The mackerel are marketed in Philadelphia, New York, and Boston.

Most of the salt consumed in the fisheries at Wellfleet is from Cadiz and Trapani, but a small amount comes from Syracuse and Liverpool.

The cost of the forty-five vessels owned in Wellfleet in 1879 was estimated at $275,000. A

number are entirely unemployed, however, and the value of all has depreciated. About $54,000 are invested in seines, boats, &c.

The "lay" most commonly used is the "seiners' half-line." According to this system, one-sixth of the total value of the fish caught is paid for the seine; and after this amount and the inspection fees have been subtracted the remainder is divided equally between the vessel-owners and the crew.

Fishing vessels in general are insured by the Wellfleet Marine Insurance Company at three-quarters of 1 per cent. on their full value, or a large fraction of it. Vessels fishing on the banks are insured at 3 per cent. All vessels are insured by the month.

THE ALEWIFE AND BLACKFISH FISHERIES AT WELLFLEET.—In order to enable some of the alewives to reach the ponds which were their natural spawning-grounds, "fish were allowed to be taken in Herring Brook only on Mondays, Wednesdays, and Fridays, except for codfish bait. 1773."* This regulation is still in force, and fish are taken from the brook on those days only.

The blackfish (*Globiocephalus intermedius*), which until within a few years has been quite abundant in Cape Cod Bay at certain seasons of the year, furnishes a valuable oil, which has been a source of a considerable revenue to the people of Wellfleet and other Cape towns. In 1620 the Pilgrims landing at Wellfleet are said to have discovered the Indians engaged in cutting up a *grampus*. In all probability this was not a true grampus, but simply a blackfish.

In a description of Wellfleet by Levi Whitman, in the Collections of the Massachusetts Historical Society, for the year 1794, the blackfish fishery is alluded to in the following language:

"It would be curious indeed to a countryman who lives at a distance from the sea to be acquainted with the method of killing blackfish. Their size is from 4 to 5 tons weight, when full grown. When they come within our harbors boats surround them. They are as easily driven to the shore as cattle or sheep are driven on the land. The tide leaves them, and they are easily killed. They are a fish of the whale kind, and will average a barrel of oil each. I have seen nearly four hundred at one time lying dead on the shore. It is not, however, very often of late that these fish come into our harbor."

While I was in Wellfleet Mr. Elisha Atwood very kindly gave me some interesting facts regarding the history of the whale fisheries here. He informed me that seventy-five or eighty years ago, there were four captains, each, with his vessel, employing fourteen hands, hailing from Wellfleet. They went to Labrador for right-whale, Mount Desert and vicinity for humpback-whale, and the West Indies for sperm-whale. There were watchers on the shore who signaled to the whalemen the appearance of a whale in the bay. These men would then go out after it and tow it inshore to the islands, where the oil was tried out. There is no whaling from Wellfleet now. Fifty-five years ago the whale-oil trying on Griffin's Island and Bound Brook Island came to an end. Just prior to this sixteen persons were employed. Ten or twelve years ago the last vessel was fitted out for the West Indies, but proved a failure.

In 1874 a company was organized under the name of the North American Oil Company, for the purpose of trying out blackfish blubber. Its capital, invested in a building, steam-boiler, tanks, kettles, boats, &c., amounts to $2,400. In 1875 the number of barrels of oil extracted was 300; in 1876, 100 barrels. During the years 1877, 1878, and 1879 no blackfish appeared on the coast, and the company was obliged to suspend operations. This company has also carried on a small business in splitting and preparing menhaden for bait.

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* History of Eastham, Wellfleet, and Orleans, by Enoch Pratt, p. 126.

PRESENT CONDITION OF THE OYSTER TRADE OF WELLFLEET.—Ingersoll, in his report on the oyster business, says:

"It is probable that this season (1879–'80) the sum of the freights paid to Wellfleet and Provincetown schooners on oyster cargoes alone will exceed $75,000, and the losses and casualties will be few. The competition of the steamers between Norfolk and Boston, of the railroads, and particularly the recent custom of opening so many oysters in Virginia, has been severely hurtful, however, to the oyster-schooner interests.

"I may add an odd note of interest to naturalists. At Wellfleet are found many marine invertebrates not known elsewhere north of Virginia, which the naturalists of the United States Fish Commission say were probably introduced with imported oysters.

Number of planters, wholesale dealers, and shippers		3
Number of vessels engaged (including those owned at Provincetown)		46
Present value of same		$185,000
Number of sailors employed (three months)		250
Earnings of same		$15,000
Total earnings of vessels		$75,000
Annual sales of—		
I. Native oysters	bushels	600
Value of same		$500
II. Chesapeake "plants"	bushels	6,000
Value of same		$5,000
Total value of oysters sold annually		$5,500

"GROWTH OF THE OYSTER TRADE OF WELLFLEET.—Realizing that their natural resources in oysters had disappeared, and that any attempt to preserve the beds by a system of propagation was unsuccessful, the people of the coast of Massachusetts Bay turned their attention many years ago to replacing their oysters by importations from more favored regions, which should be kept in good condition during the warmer half of the year by being laid down in the shore-water, and so held in readiness for the autumn trade. This operation was called 'planting,' but it is a misuse of the word, and the other popular phrases, 'laying down,' or 'bedding,' express the fact more truthfully. It is not oyster culture at all, but only a device of trade to get fresh oysters and increase their size and flavor, which adds proportionate profit in selling. It is neither intended nor desired that they shall spawn.

"Just when this practice began on Cape Cod—for Wellfleet, whence had come the latest and best of the native oysters, naturally became the headquarters of the trade—is uncertain; no doubt it was some time before the opening of the present century. There is a gentleman now living in the village of Wellfleet, Mr. Jesse D. Hawes, who is 84 years old. He cannot remember when they did not bring some oysters every fall from New York Bay, to use at home and sell in Boston.

"It is surmised that when the native beds became exhausted, the inhabitants got into the habit of going to Buzzard's and Narragansett Bays, then to the Connecticut shore, and finally to New York, and laying down more and more yearly in Wellfleet Harbor, until finally a considerable business grew. Egg Harbor, New Jersey, was also a ground much frequented a little later by oystermen.

"By the year 1820, I am informed by Mr. Frederick W. True, who made inquiries for me on this subject, 12,000 to 14,000 bushels were brought to Wellfleet yearly, and ten or twelve shops were opened by Wellfleet men for their disposal in Boston and Portland. This accounts for the striking fact that there is hardly an oyster dealer on the New England coast, north of Cape Cod, who is not a native of Wellfleet, and a certain small circle of old names seems to inclose the whole

trade. Besides the citizens, however, many strangers came in and procured the privilege of bedding down imported oysters to fatten on the flats of this hospitable harbor. In 1841, Mr. Gould, the conchologist, wrote that the whole trade at Wellfleet then employed thirty vessels of about 40 tons each, and the services of about one hundred and twenty men for three months of the year, This yielded to the town a revenue of about $8,000 annually.

"The process of 'bedding down' was as follows: Each proprietor of a space upon the flats chartered the services of a vessel, in the latter part of the winter, to go to some specified oyster ground and purchase a certain number of bushels, for which he gave the captain money. The vessel was chartered at a round sum for the trip, or else was paid at a rate varying from 15 to 20 cents a bushel freight on the cargo. When the vessel arrived home she anchored in the distant channel, and the oysters were unloaded into dories, fifty bushels to a dory. The dories then proceeded to the grounds, which had been already divided into rectangles a few rods square, by rows of stakes, and deposited a load of fifty bushels in each rectangle or 'square.' In order that the oysters might be distributed as evenly as possible over the bottom, the dory was rowed to the center of a square, and anchored at both ends. The dorymen then threw out the oysters with shovels into all parts of the square. This was done when the water was high over the beds. When the tide was out the oysters were redistributed with forks or 'spreading machines.' The similarity of this proceedure to the seeding of a field is obvious, and sufficiently explains the phrase 'oyster-planting.' It afforded occupation to a distinct class of men, who did it by contract, the ordinary price being about 10 cents a bushel for placing them upon the beds. The season for bedding began in February, as soon as there was a surety of no further danger of hard freezing, and continued until April, the ground chosen being the hard surface of the flats in the western portion of the bay, where the beds would be left dry about two hours at each low tide. The oysters had very little fresh water near them, and their growth was variable, seeming to depend on the weather, but in what way, or just how it affected them, I could not learn. In a favorable season they grew very rapidly, in respect to both shell and meat, so that the 100 bushels put down in April would fill 300 bushel measures when taken up in October. The percentage of loss was always considerable, however, probably never less than one-quarter, and now and then amounting to the whole bed. Drifting sand, sudden frosts when the beds were exposed, disease, and active enemies were the causes that operated against complete success. I could not obtain satisfactory information concerning prices during the first quarter or half of the present century, and am inclined to believe they did not differ much from the present rates, except that selling rates were uniformly higher, and far more profit was realized than is now possible. Dr. Gould, describing the winter work in his Invertebrates of Massachusetts, states that in the autumn the oysters are taken up, selected, brought to market, and sold at wholesale for $1 per bushel, the cost of planting, attending, taking up, &c., amounting to 20 cents per bushel. Thus a profit of 30 cents on a bushel, or about 40 per cent. on the cost, is realized; and the town of Wellfleet thereby realizes an income of about $8,000 annually.

"It was asserted by citizens of Wellfleet, both to me and to Mr. True, that not until 1845 were any oysters brought to Wellfleet from Virginia, and that the cause of their importation then was the high price asked for 'seed,' as the oysters purchased in the Somerset River, in Connecticut, and in New York, for bedding, were erroneously termed. William Dill is credited with being the first captain engaged in the Chesapeake trade. I think, however, that there is an error here, for Gould mentions in his book that in 1840, 40,000 bushels were brought to Wellfleet annually from Virginia, at a cost of $20,000. Nevertheless, it was not until about 1845 or 1850 that the business began to confine itself to Virginia oysters and a large business to be done. At its height, about

1850, it is probable that more than 100,000 bushels a year were laid down in the harbor; some say 150,000. One consignment alone of 80,000 bushels was remembered by Mr. S. R. Higgins, who kindly gave me the many facts noted above. The favorite ground was at the mouth of Herring River.

"This great business gave employment to many men and vessels, and was eagerly welcomed by the Wellfleet people. Responsible men were accustomed to meet the incoming vessels and take contracts to bed the oysters. The ordinary price was 9 cents a bushel. They hired help at day's wages, and often made a good profit. Fifty men would thus often be busy at once.

"During the summer partly, but chiefly in the fall, these great deposits, which would perish during the cold winter, but were now well grown, were raked up and sent to the warehouses in Boston, Portland, and minor ports, in freight vessels and in packets. Usually the oysters were owned and bedded by dealers, who used them in their regular trade, but some were owned by speculators, who took them to market or sold them to dealers as they lay upon the beds, the purchaser taking all risks. The measure used for oysters in those days was a half-barrel holding a bushel, called a 'bushel-barrel.'

"The war of the rebellion, however, interfered somewhat with the oyster trade, and it began to decline, so far as Wellfleet was concerned. Then the various dealers in northern ports, having learned something, began to bed near home in their own harbors, and so saved freightage. Finally the steamers from Norfolk and the railways entered into so serious a competition, that fully ten years ago Wellfleet Bay was wholly deserted by the oystermen, as a bedding-ground, though her vessels still continue to carry cargoes in winter from Virginia to Boston, Portland, Salem, Portsmouth, and the Providence River, to supply the active trade and fill the new beds, which the dealers at these various ports had learned could be established at home.

"The reader thus discovers how important a part Wellfleet has played in the history of the oyster-trade of New England. A hundred thousand bushels of the bivalves once grew fat along her water front, and thousands of dollars were dispensed to the citizens in the industry they created. Now, a little experimental propagation, of the value of a few hundred dollars, and about 6,000 bushels of bedded oysters from Virginia, worth perhaps $5,000 when sold, form the total active business. The oyster fleet, however, remains, though greatly diminished and carrying its cargoes to Boston, Portland, and elsewhere, instead of bringing them to be laid down in the home harbor. It will be long before Wellfleet and its neighbor, Provincetown, lose the prestige of old custom as oyster-carriers."

76. FISHING TOWNS FROM EASTHAM TO DENNIS.

EASTHAM.—Eastham Township occupies the entire section of Cape Cod between the towns of Wellfleet and Orleans, a territory about 6 miles in extent, north and south. The Cape at this part is uniformly about 3 miles wide. The township contains the post-offices Eastham and North Eastham, but only a small number of houses are grouped about them, the majority being scattered irregularly along the principal roads. The principal kinds of apparatus in use here are weirs, gill-nets, and seines. Six weirs—one of them a deep-water weir, the others shoal-water weirs—are located in the bay, within the limits of the town. An additional shoal-water weir, located at Billingsgate Island, near the light, is owned in Eastham. Each of these weirs is tended by about four men. The catch consists almost exclusively of bluefish, sea-herring, and, in some years, menhaden. The main dependence, however, is placed upon the bluefish, and the profit accruing is almost entirely from this species. The first weir used on the north shore of Cape Cod was erected in North Eastham.

About eleven men are engaged in seining bluefish with purse-seines during the summer months, and these, together with six or seven who do not use seines, set gill-nets also for bluefish. The seiners own eight or ten little vessels about 30 feet long, and about one-half the number carry their fish to market, while the others send theirs by rail. Each boat carries one seine. Six or seven of the men who use gill-nets for bluefish employ others also for mackerel. Probably 170 bluefish gill-nets and 100 mackerel nets are owned in Eastham.

ORLEANS AND SOUTH ORLEANS.—Orleans is situated near Town Cove, the head of an inlet, which, after many windings, opens on the ocean side of the cape. About one hundred and twenty men make their living by fishing. Of these, twenty are engaged in weir, net, and line fishing in the vicinity of the village, and the remainder ship on fishing vessels in other places, mostly in Provincetown. As many as five mackerel vessels are owned almost entirely in Orleans, and have captains and crews who belong in the town. These vessels fit out and sell their fish in Boston and Provincetown. A considerable proportion of the men who are engaged in the offshore fishery in summer remain at home in winter and carry on a clam fishery in Town Cove. Both soft clams and quahaugs are gathered. Twelve or fifteen men are engaged in tending the weirs, of which there are three. They are all erected on the flats extending from the shore of the bay, and are not more than a mile apart.

Fifty gill-nets are set by four men for mackerel in May, also in October and November. In the fall of 1878 and the spring of 1879 very few mackerel were taken, but in the spring of 1878 each man engaged made from $30 to $75. In the fall ten or fifteen men fish for cod with hook and line, for their own consumption. In the fall of 1878 each caught an amount equal to 500 pounds when dried, but this is unusual.

South Orleans is a small and somewhat scattered village, situated directly south of, and about 2 miles distant from Orleans proper. In 1879 quite an extensive clam fishery was being carried on here, which gave steady employment to twelve men. Some 1,200 barrels of soft clams and quahaugs are taken here during the season, and sent to Boston and New York. About the year 1876, 1,000 bushels of oysters were planted in Pleasant Bay, South Orleans, by a Boston merchant. They were speedily buried by the sand, however, and the enterprise proved a failure.

At East Orleans six men, with three cat-rigged boats, fish with hand-lines for cod and pollock between May and November, and in winter three men trawl for cod. The fishing is carried on just outside the mouth of Town Cove. One man engages in a lobster fishery. He owns 40 pots, and in 1879 took 35 lobsters daily from May to October. About four or five years ago eleven men were engaged in this fishery, but they considered it unprofitable and left it.

BREWSTER.—The villages of East Brewster, Brewster, and West Brewster occupy the stretch of coast between East Dennis and Orleans, on the north side of Cape Cod, about seven miles in extent. There is no harbor here, but a vast flat, exposed at low water, extends in many places at least a mile from the shore. The principal fishery now engaged in at Brewster is the weir fishery. There are five weirs in operation within the limits of the township. They are all "flat" weirs, constructed of laths and poles. Their average value is from $400 to $500. Each weir is "tended" by four or five men. There is but little regularity in the amount of catch, but perhaps the average catch in each of these weirs is 50,000 pounds of fish. In fall about twenty men are engaged in cod fishing from boats for six weeks or two months. They make about $25 each for the season. Some of the codfish are salted and sent to Boston, and the remainder sold fresh in the neighborhood.

An alewife brook, located at West Brewster, produces from 50 to 100 barrels of alewives annually, which are distributed to citizens of the town at a nominal price. Each person is entitled

to one eighth of a barrel. If more than enough to supply the wants of the town are taken, the surplus is sold to outside parties.

PRESENT CONDITION OF THE FISHERIES OF CHATHAM.—The town of Chatham occupies the most southeasterly portion or what is commonly called the "elbow" of Cape Cod. Its territory is deeply indented on all sides by arms of the sea, and in reality forms a short and broad peninsula, the greatest length of which is about five miles. The township contains the villages of Chatham, North, South, and West Chatham, and Chatham Port. All of these villages are removed a considerable distance from the line of railway, and are connected with it by a stage route.

Chatham, the most important village of the town, occupies the southeastern section. The larger proportion of the dwellings are situated nearly a mile from the harbor and wharves. The fishing business of the place has greatly declined within twenty or twenty-five years. A number of years ago the sea broke through and destroyed the best harbor, leaving only the one to the westward of Monomoy flats, known as Stage Harbor. This harbor, although of fair size, is shallow in most parts, and has a very narrow channel, and a troublesome bar at the mouth.

The principal fisheries at present engaged in are the George's Bank cod fishery, the boat cod fishery, the offshore mackerel fishery with seines, the mackerel fishery with gill-nets, the Monomoy weir fishery, the lobster fishery, and the clam fishery.

The offshore cod fishery is carried on by a firm who have their establishment on Harding's Beach. In 1879 five vessels, with crews of about eleven men each, were employed in cod fishing on Nantucket shoals from about the 20th of April to the middle of August. Hand-lines are used altogether. They were accustomed to come in on Saturday, and having obtained a supply of bait from the flats, to depart again on the following Tuesday. During a part of the time, however, the vessels made trips of two weeks' duration, and carried the fish caught into Gloucester. In 1879 they averaged 600 quintals of codfish each, of which perhaps one-sixth was sold in Gloucester.

The boat cod fishery off Monomoy gives employment to about one hundred and fifty men, the majority of whom belong in the village of Chatham. They use small cat-rigged boats about 20 feet long. Sometimes two men go in one boat and sometimes but one, the number of boats in use being about one hundred. The men who go alone are usually old and experienced fishermen, and hence the catch of these boats is always more than half the catch of those which carry two men. In 1879 the boats averaged from 40 to 150 quintals of cod. The larger portion of the fish are sold to little vessels called "pickpockets," in which they are carried to Hartford, New Haven, Providence, and other Rhode Island and Connecticut ports.

After the cod-fishing season is over, about the 1st of September, the five fishing schooners are employed in seining mackerel off the coast of Maine. They fit out for the first trip at Chatham, but after that at the port where the mackerel are sold; it may be at Portland, or any other of the eastern ports. A small proportion of the fish are sold fresh in Boston. After the mackereling season is over the men engaged carry on the clam fishery to some extent.

Between 150 and 200 mackerel gill-nets are owned in Chatham, and are usually set during the month of May. They are owned by twelve or fifteen men. All the fishermen except one sell the mackerel caught to peddlers, the man forming the exception marketing his fish in Boston. For three years very few mackerel have been taken.

In 1879 ten deep-water weirs, all large except three, were set on the flats on the western side of Monomoy Island. These weirs are first placed in position about the middle of April, and are removed at the latter part of May or the 1st of June. Each employs about twelve men, two cooks, and a book-keeper. The principal fish taken are mackerel, shad, sea-herring, menhaden, and codfish. The mackerel are sold chiefly in Boston, but a few also go to New York. The men-

haden and herring are sold to Gloucester fishing schooners for bait. The fish are transported to Boston by the way of Dennis Port. Five or six little schooners carry them from Chatham to Dennis Port.

About twenty men in Chatham and about the same number making their summer quarters at Monomoy set pots for the capture of lobsters, from the beginning of June to November. Each fisherman owns from 40 to 80 pots. The lobsters are sold in Boston and are carried thither in smacks.

The winter clam fishery is carried on by fishermen who do not make sufficient money during the summer to support their families, by old men who are unable to join in offshore fishing, and by boys. Altogether about one hundred and fifty persons are employed. They begin in November and rake on every fair day until April. The sea clams are either sent directly to Provincetown fresh, or are salted and sold to the grocers of the village, who advance money on the same and hold them until spring, when they bring good prices. In 1879 about 700 barrels were raked and barrelled.

Five or six bluefish and bass seines are owned in Chatham. They are shot from the beach, sometimes on the ocean side and sometimes in the harbor. Five men are required to manage each seine. The season begins in May and lasts until October. In 1879 the catch was 12,000 pounds of bluefish and 3,000 pounds of bass. The fish are iced in boxes and sent to New York.

The fisheries of North Chatham and Chatham Port are not important. A number of boats from North Chatham join the cod fishing fleet, and twenty men are engaged in digging clams in Ryder's Cove in winter.

West Chatham is not situated near the water and is only indirectly interested in the fisheries.

HARWICH.—The town of Harwich lies between Dennis and Chatham. Its only coast line is on the south, being shut in on the north by Brewster. It contains the villages of Harwich, North, East, South, and West Harwich, and Harwich Port. The last named is the only important fishing-village in the town. West Harwich, in regard to fishing interests, can scarcely be considered as a separate village. It is separated from Dennis Port only by an imaginary line and the interests of the two are identical; they will therefore be treated together under "Dennis Port."

Harwich Port, like many of the Cape Cod villages, is built mainly upon one long street running parallel to the coast line. From this street others make off at right angles leading to the wharves. About 200 men are engaged in the fisheries. In 1879 about 40 men shipped at Portsmouth, 125 manned the vessels sailing from the villages, and from 30 to 40 were employed at the wharves in preparing the fish for market. Nearly the entire remainder of the male population of Harwich Port, in many cases with their families, are engaged in the merchant service and are scattered all over the earth. There are two sail-lofts in Harwich Port, which together would furnish about enough employment for one man during the whole year. The sails made here are principally for the cat-rig boats of Chatham. A boat factory, established over twenty years ago, gives rather scanty employment to two men. During the winter of 1878 two cat-rig boats, worth about $300 each, were made for some Chatham fishermen.

The only fisheries carried on at Harwich Port are the mackerel and the weir fisheries and incidentally the cod fishery. The mackerel fishery is carried on by two firms at two wharves a few hundred yards apart. Each firm in 1879 owned six schooners, carrying crews of fourteen or fifteen men each. In that year one vessel fished in the Gulf of Saint Lawrence, but the others mostly on the Maine coast.

The fishing season opens about the 1st of April and closes about the 10th of November, after which time the vessels are hauled up for the winter. The trips average about three weeks each.

The amount of capital invested in vessels is about $40,000; in apparatus, $20,000; and in buildings and wharves, $2,500. One of the firms sends half of the mackerel taken to Philadelphia and half to New York. The other firms send one-sixth to Philadelphia and the remainder to New York and Boston. The vessels are insured for periods of six or seven months, in Provincetown, Wellfleet, and other places. Two of the vessels belonging to one of the firms make one trip in the spring to Nantucket Shoals for codfish. In the spring of 1879 the catch was 600 quintals.

A weir has been in use at Harwich Port for thirteen years. It is a double weir, having two leaders, pounds, and bowls. It is placed in position about the 20th of April, and is taken up in the latter part of May. Its original cost was $3,000.

South Harwich is located about 4 miles west of Chatham, and has within its limits the wharves and buildings of two firms carrying on the fishing business. Four cod vessels and four mackerel vessels are owned here. The cod vessels carry from nine to twelve men each. Two of these vessels go to the Banks, and make but one trip; the others go to Nantucket Shoals. About 4,000 quintals have been brought in by these four vessels annually for a number of years. The fish are sold to small vessels, which carry them to Rhode Island and Connecticut ports. The four mackerel vessels are employed from the 1st of April to the last of October. They go south in spring, and follow the fish to and along the coast of Maine. They make trips from two to six weeks in length. Each vessel carries from fifteen to twenty men. From 800 to 1,000 barrels of mackerel are sometimes brought from the Monomoy weirs, and are packed here. Ten or twelve men are employed for about one-third of the year at the wharf in salting and preparing the mackerel for market. During the remainder of the year they either remain at their homes, or, if opportunity is offered, ship on coasting vessels. The wharves at this place are exposed to rough weather in winter, and are often damaged by ice.

Two small weirs are owned in South Harwich. One is situated at a short distance to the west of the wharves, and the other a similar distance to the east of them. They are constructed of netting, and have only a single leader and pound. They are not placed at so great a distance from land as the Monomoy weirs, because the water is deeper.

The condition of the fisheries of Harwich at the opening of the present century is shown in the following note from the Collections of the Massachusetts Historical Society:* "Fifteen or twenty vessels, averaging 40 tons each, and about half of them owned in the precinct, are employed in the shore fishery on the coast. Four vessels of 100 tons each, which go to the Banks of Newfoundland and the Straits of Belle Isle, sail also from this place and obtain their men here. The whole number of men and boys engaged in the cod fishery is about two hundred, but several sail from Chatham, Bass River, and the North Precinct."

During the first quarter of the century the business does not seem to have increased very much. It is recorded by Freeman, in his History of Cape Cod, that in 1837—

"There were here about twenty vessels engaged in the cod and mackerel fisheries; the aggregate tonnage about 1,300 tons. The result of their voyage was 10,000 quintals of codfish, worth about $30,000, and 500 barrels of mackerel, worth about $3,000. The amount of salt used in the business was 9,000 bushels; the number of hands employed 200, and the capital invested $60,000."

During the second quarter the fisheries increased very rapidly. The number of vessels twice doubled. In 1862 eighty or one hundred vessels were employed in the cod and mackerel fisheries, and several wharves and packing establishments were connected with the business. For the

*Note on the South Precinct of Harwich, in the County of Barnstable. September, 1802. <Coll. Mass. Hist. Soc., VII, 1st series, p. 141.

eleven years from 1868 to 1878 inclusive, the number of fishing licenses issued for vessels over 20 tons belonging in Harwich was as follows:

1868	35	1874	31
1869	33	1875	27
1870	38	1876	24
1871	36	1877	20
1872	28	1878	20
1873	30		

DENNIS.—The village of Dennis, or North Dennis, as it is often called, is located in the northeastern portion of Dennis Township, and is distant from Yarmouth about three miles by air-line. Between Dennis and Yarmouth is an extensive salt marsh, through which flows a creek known as the "Chase Gardner Creek."

With the exception of a small and uncertain cod fishery carried on for a short time in spring and fall with boats, the pound fishery of the Nobscusset Fish Weir Company is the only fishery prosecuted at Dennis. This company own a shoal-water weir, situated near Chase Gardner Creek, for the management of which they employ four men, and from which in 1879 36,600 pounds of fish were shipped.

Dennis Port is situated in the southeastern part of the town and about a mile from the shore. Its streets are continuous with those of West Harwich, and the two villages are separated only by an imaginary line, and, except in matters of town government, are practically one village. At present there are four firms carrying on the fishing business; three are connected with the trade in fresh fish, and two with the offshore cod and mackerel fisheries. These firms carry on their business at two wharves, known as the east and the west wharves. Twelve schooners are owned here, six of which are employed in the cod fishery and six in the mackerel fishery. Each vessel carries about sixteen men.

The cod fishery begins in April and lasts until August, and about seven trips are made in this time. In 1879 five of the vessels employed hand-lines and one used about 12,000 hooks of trawl. In 1879 3,100 quintals of codfish were taken by the six vessels. The fish are salted, and part are sent to Boston market and part sold to peddlers, who carry them in small vessels to Rhode Island and Connecticut ports. Seven such vessels are owned in Dennis Port and employ about fifteen men. They are the same that bring fresh fish from the Chatham weirs in spring.

The mackerel fishery was carried on in 1879 with six vessels, each with an average crew of fifteen. Two of the cod vessels are also employed in this fishery at the close of the cod-fishing season. All use seines. The total catch of all the vessels in 1879 was 6,125 barrels. In addition, about 3,000 barrels are brought from the weirs at Monomoy and packed here. These fish are prepared for market by about two hundred men. Two-thirds of them are iced and shipped to New York and Boston fresh, and the remainder are salted and barreled. This work occupies about six weeks. When it is over the men go into other branches of the fishery. The boats which have brought the fish from Monomoy take in cargoes of 10 or 12 barrels of mackerel and a quantity of codfish, varying from 25 to 200 quintals, and peddle them at various ports in Rhode Island and Connecticut. Some of the men employed in preparing the mackerel for market, when that employment comes to an end, go into the bluefish fishery, swelling the number in that fishery to about sixty. The mackerel fishery is carried on in spring also by two men, who employ twelve mackerel-nets. In 1879 about sixty men, employing twenty boats and little vessels, were engaged in line-fishing for bluefish and for tautog, scup, and other species. The fishery lasts until the middle or last of October, when the boats are hauled up. Four of the boats also each set twelve

bluefish gill-nets. About 150,000 pounds of bluefish and one-third as many pounds of tautog, scup, &c., are annually caught. Together with the other fish brought from the Monomoy weirs, there are usually 75 or 100 barrels of shad and a number of salmon.

During the winter, that is from November to April, about one hundred and twenty men belonging in Dennis Port and an equal number from the neighboring villages are engaged in a clam fishery. They go out to the beds singly in dories. In the winter of 1878 about 2,000 barrels of clams were gathered. Twenty men are employed to open them. They are shipped fresh to Provincetown, Gloucester, Boston, and other ports, to be used for bait. In 1877 and 1878 about three-fourths of the whole number were shipped to Boston. The total capital invested in this business is about $8,000.

The amount of capital invested in vessels is about $35,000; in seines and other gear, about $10,000; in wharves and store-houses, about $8,000; in mackerel and bluefish gill-nets, $2,500; in boats and little vessels for the line-fishery, $8,000; in dories and other apparatus for the clam-fishing, $8,000. The total amount invested in all branches of the fisheries is about $100,000.

West Dennis is situated in the southwestern part of the town, on Bass River, a considerable stream, which has its source in a small pond on the northern side of the Cape and is swelled by the inflowing of the tide. Some five or six boats are employed in the bluefish line-fishery off the mouth of the river. About 150 barrels of bluefish are annually shipped. A number of gill-nets are also employed for the capture of bluefish. In 1879 about 1,700 bluefish were taken in them. The majority of the fish are shipped through Mr. George Loring, of South Yarmouth.

A small number of alewives are annually taken in an artificial brook cut between one of the ponds in West Dennis and the salt water. About 10,000 alewives are taken.

At South Village, a small hamlet about a mile south of West Dennis, there are four men who together own and employ eighteen bluefish gill-nets. In 1879 about 20,000 pounds of fish were caught, of which 2,000 was salted, and the rest shipped to market fresh.

A clam-fishery, similar to that carried on at Dennis Port, is engaged in here every winter by about fifteen or twenty men. They secure from 100 to 150 bushels of clams each during the season.

77. THE FISHERIES OF YARMOUTH AND BARNSTABLE.

YARMOUTH.—Yarmouth is a quiet little village, for the most part built upon one street and continuous with the village of Barnstable. Yarmouth and Yarmouth Port are essentially the same village, being separated by an arbitrary line. At one time this was the seat of a considerable cod and mackerel fishery. Before the Revolutionary war there were said to be thirty-four fishing vessels in the town of Yarmouth, a large share of them probably belonging on the north shore; in 1789 there were thirty-two, and in 1790 there were thirty. These were probably small vessels of 15 or 20 tons engaged in the shore cod fishery. Captain James B. Crocker, of Yarmouth Port, went into the fishing business about 1854. At that time there were about eight fishing vessels. Relics of the old fleet were there in the schooners Wave and Leo, each about 60 tons old or 40 tons new measurement, shallow and poor sailers, valued at $700 or $800 each. For a time subsequent to this the mackerel fishery was prosecuted quite vigorously with a larger class of vessels, and there were ten or eleven of these when the fishery was at its height, about 1857 or 1858. Among these were the Kentucky, the Anna L., the Thatcher Taylor, the Karenhappuck, the Fillmore, the Olive Branch, the Hockanom, the Everett, and the Premium. The last of these vessels left Yarmouth about 1860. This was the Kentucky, which was then sold at Provincetown.

Mackerel packing, according to Captain Matthews, was begun at Yarmouth about 1831. At

times when mackerel were scarce and there were few vessels that went cod-fishing, there were usually two in this business. They do not appear to have gone to the Grand Bank, but chiefly to Quereau and Cape Sables (as the fishermen call it). Captain Matthews is of the opinion that the mackerel fishery was carried on there with considerable energy from 1838 to 1840. Yarmouth does not appear to have been devoted to any considerable extent to the fishery beyond supplying capital. From 1854 to 1860, according to Captain Crocker, most of the fishermen and skippers came from Orleans and Harwich, and it was found difficult to hire men to ship in the Yarmouth vessels because of the hard work in getting vessels into the harbor and getting the fish ashore. The fishery was finally given up because only shallow vessels could get into the harbor, and these were not suitable to be used to advantage in the winter for mackereling or other purposes. In 1879 twenty or thirty Yarmouth men were engaged in fishing, shipping from Harwich, Provincetown, and other ports. One fishing skipper belongs here.

Hitherto in Yarmouth as in Barnstable, three or four men have engaged in cod fishing in spring on the bar at the mouth of Barnstable harbor, and have helped to make up the amount of 20,000 pounds of fish usually taken on that bar. This year, however, the fishery was a failure.

Capt. Benjamin Lovell, half owner of the weir at Sandy Neck (see Barnstable), has a sweep-seine, worth perhaps $100, which he uses for the capture of various kinds of fish. He also sets twelve or fifteen lobster pots. This fishery has been carried on for many years, but from 1876 until the present year it scarcely supplied local demand. This year, however, Captain Lovell has caught at least 2,500 lobsters.

The Yarmouth Fish Company, Daniel B. Crocker, treasurer, has a capital of $2,500, and there are 249 shares and 54 owners. They own a weir, which was put down in 1859. In 1878 about 150 barrels of fish were shipped; in 1879, about 100 barrels, and in 1880 the same. There is no harbor except in a shoal creek flowing through the marshes between the village and the bay. Here it is said that 12 or 15 vessels were formerly laid up in winter, but it seems almost incredible that they could have been brought up to the wharves. The wharves and the fish stores are dilapidated and essentially useless.

South Yarmouth comprises 3 small villages—South Yarmouth proper, Georgetown, and lower village. South Yarmouth itself, situate 1 mile from the mouth of Bass River, is the largest place, but contains few fishermen, and is not dependent on the fishing. Georgetown is a small hamlet of about 10 fishermen's houses, and is dependent upon the fresh fishery. It is about 1 mile above South Yarmouth, on Bass River; the lower village is but a short distance below South Yarmouth, and does not depend on the fishery. In all these villages together there are probably forty men who make a living during nine months of the year by fishing with hook and line in small cat-rig boats, off the mouth of Bass River. Twenty men, including about ten of the forty men mentioned above, make a partial living by eel fishing. It is estimated that they average 1,000 pounds of eels apiece annually, which would make an aggregate of 20,000 pounds. Some thirty men are employed in line fishing off the mouth of Bass River. They use small cat-rigged boats, worth from $100 to $300.

In spring codfish are caught, and later in the season bluefish, scup, and flatfish. In 1879 about 60,000 pounds of bluefish and 30,000 or 40,000 of scup and flatfish were taken by the fishermen. The larger proportion are shipped by two firms having a capital of about $3,000. Four sweep-seines are owned in South Yarmouth, and are used for the capture of herring off the mouth of Bass River. A number of gill-nets are used annually by five men for the same purpose.

The privilege of the alewife fishery in Bass River is held jointly by the towns of Dennis and Yarmouth. The fishery is leased annually to private individuals for about $700. The alewives

are caught with sweep-seines in a pond at the head of the river. Fishing is allowed on four days only of each week. In 1879, 140,500 alewives were taken. Each citizen of Dennis and Yarmouth has the privilege of buying 400 alewives at 40 cents per hundred. About 75 barrels of white perch are also caught annually in the river. Each citizen of the two towns may buy a peck of them for 85 cents. A few smelts, tom-cod, and flatfish are also caught in the river.

BARNSTABLE.—The village of Barnstable is built mainly upon one long street running parallel to and about a half mile distant from the south shore of Barnstable Harbor. It contains the court-house and custom-house for the county and the residences of many wealthy citizens. It cannot at the present day be classed with fishing villages, properly speaking, although until 1860 several fishing vessels were owned here and sailed from this port. The village is now, seemingly, principally supported by the capital which the retired captains of whaling and merchant vessels who make their residence here have brought with them. The wharves, which, in large measure, are in decay, are located at some distance from the mouths of two creeks in an extensive salt marsh. The sand has washed in, almost filling the creeks and making it difficult for even small boats to go in and out.

The only vessel at present owned in Barnstable is the Pontiac, a schooner of about 15 tons. She is employed by her owners, Messrs. James & George Smith, in a variety of fisheries. In spring and fall she has been used in setting mackerel nets, and in summer in lobster fishing in Buzzard's Bay or in bluefish fishing with nets on the outside of the cape.

A weir belonging to Capt. Benjamin Lovell, of Yarmouth, and a partner, is located in a cove near Sandy Neck light-house, on the north side of Barnstable Harbor. It has not proved very successful. During the present year (1880) no fish have been shipped for want of ice.

A cod and pollock fishery has been carried on by four or five men for a number of years from March to June at the edge of the bar which closes the mouth of the harbor. This fishery has been quite successful, yielding about 15,000 pounds of cod, and 5,000 pounds of pollock annually, until the present year, when it proved an almost absolute failure.

Since 1878 two men have done a considerable business in catching and shipping eels. In the year 1878 they shipped about 5,400 pounds, and in 1879 about 5,800 pounds. The fishing begins about the middle of May, and lasts until the middle of September.

For three or four years a fisherman belonging in Barnstable, with the aid of a partner from Yarmouth, has set a few lobster-pots in the harbor. In 1879 eight pots were set during July, and 200 or 300 lobsters taken. In 1880 twelve or fourteen pots were set, but the catch was about the same as that of the previous year.

Scallops are abundant along the shores of the harbor, and in 1876 a party of men from Hyannis established themselves here for the purpose of gathering them. In 1877 the price of scallops declined very greatly, forcing these men to abandon their enterprise. The fishery was continued, however, by two men of Barnstable. In the winter of 1877–'78 the latter shipped 40 half-barrels of "eyes," and during the winter of 1878–'79 only 6 half-barrels. They were sent to Boston and New York.

A shoal-water weir was built on the shore of the bay, west of Beach Point, in 1870, for the purpose of catching bass and bluefish. It was not successful and was abandoned in 1876. In the spring of the latter year a deep-water weir was erected off Beach Point; 20 or 30 barrels of mackerel were taken in it, but it was soon broken down by the waves, and has not been replaced.

Several fishing vessels were owned in Barnstable prior to 1860 by N. & W. Scudder and one other firm. Among the last employed here were the Emma C. Latham and the Flying Fish.

Hyannis is a flourishing village situated in the southern part of Barnstable Township. Its

prosperity, however, is due, perhaps, more to the fact that it contains the residences of many wealthy retired captains, than that a portion of its citizens are fishermen. The wharf, at which the fishing business is carried on, is distant more than a mile from the village, and is owned by the railroad company, that also use it and have connected it by rail with the main part of their road.

In 1879 the fisheries at this place gave employment to about one hundred men. The principal branches engaged in are the offshore cod and mackerel fisheries, the boat line-fishery, and the bluefish fishery with gill-nets. The cod and mackerel fisheries are carried on by a single firm, which owns three schooners. Each of these vessels carries about twelve men. In 1879 only one crew was composed of Hyannis men, the others living at Chatham and Harwich. In spring and summer the vessels are employed in the cod fishery, going about 25 miles from Hyannis, off Monomoy. In 1879 the three vessels brought in 600 quintals of codfish. In fall the mackerel fishing takes place. One vessel was stranded in the August storm of 1879, and hence only two went mackereling that season. The vessels are withdrawn in winter and the fishing is not carried on.

The boat line-fishery employs about forty men, twenty-five of whom belong in Hyannis; the others come from West Yarmouth and other places. About one-half of the boats carry two men, and the remainder one man. They are all cat-rigged, and are worth from $25 to $300 each. The first fish taken in spring is the flounder, then follow scup and bluefish, tautog and sea-bass, and in fall the flounder again. About 1,000 barrels of fresh fish are shipped to market annually, of which the larger proportion are bluefish and scup. Four firms are engaged in shipping the fish, but one has a much larger business than the other, and ships, perhaps, two-thirds of the whole quantity. The fishermen do not like to trust a distant and fluctuating market for their compensation, and therefore sell the fish they catch directly to the shippers; the latter then reselling to Boston and New York dealers.

The bluefish fishery is carried on by four men, who together own about twenty-five gill-nets. They also employ four other men to assist them in setting the nets. The fishing begins about the 15th of May and lasts until October. In 1879 some 12,000 pounds of bluefish were taken, and $1,200 was stocked. The fish are usually sent to New York. A net weir was erected at the west of the village in the spring of 1879, for the purpose of capturing menhaden. Only 50 barrels of menhaden were taken, however, and the enterprise failed. The weir was taken up in June. About 300 barrels of scallops are taken every winter in Hyannis Bay, by a varying number of men. They are usually shipped to New York by rail.

Messrs. Hall & Thatcher, of Hyannis, have planted a few hundred bushels of oysters annually for six years in Mill Creek, east of Hyannis. At one time they planted 600 bushels. In 1879 none were planted, and all were taken up, except about 100 bushels. Seed is obtained from Long Island Sound and Buzzard's Bay. The above firm has shipped a few oysters annually to Boston, selling them to the hotels at $6 per barrel in the shell.

Twenty-five or thirty years ago about thirty vessels sailed from the west bay of Hyannis. There were six bankers; the rest were mackerelmen. The crews came from Hyannis and vicinity. In the East Bay, or Lewis Bay, as it is called, there were two wharves, from each of which twenty vessels were sent out, mostly for mackerel. They went in the spring to Virginia and followed the fish up to the Bay Chaleur. In the winter season they were laid up. They were from 50 to 100 tons burden, old measurement. Among the last to go out were the Blue Rock, Faithful, Red Rover, Voltaire, Splendid, Enchantress, Euphrates, William King, Shade, Adrian, Potomac, Eunice Cobb, and John C. Calhoun. All these vessels were owned in Hyannis.

During the past five years every firm formed for carrying on the salt-fish trade has failed in a few months. The men concerned have been scattered, and it is very difficult to obtain information in regard to the cod and mackerel fisheries during and prior to this period.

Bluefish were first caught by the Hyannis fishermen about forty-five years ago. Twenty years ago they were still plenty, but the difficulty then was that the markets were not good. The fish were commonly sold to smacks for 1 cent per pound. It was customary at that time to salt the bluefish.

The villages of Osterville, Marston's Mills, and Cotuit are situated in the southwestern part of Barnstable Township. Marston's Mills is located at the head, Osterville on the eastern side, and Cotuit on the western side, of a deep inlet or bay, the waters of which find their way about three miles inland. The most important fishery carried on at this point is the oyster fishery. In Cotuit and the neighboring villages there are twelve firms which have capital invested in this fishery. They employ forty or fifty men. About 2,000 bushels of oysters are annually brought from several places in Buzzard's Bay, Long Island Sound, and on the Jersey coast, and Norwalk, Conn., and planted here. The available ground is now almost entirely taken up. The removal of the oysters for market begins about the middle of September, but the height of the season is from the middle of October to the first of April. About $3,000 are now invested in "seed," that is, in oysters which are to remain undisturbed for one or two years, that they may grow and fatten. The apparatus owned by the twelve companies, including scows, rakes, &c., is worth about $1,200.

In addition to the men engaged in the oyster fishery, there are from twenty to twenty-five men at Cotuit who earn a living in other branches. They own and employ about fifteen cat-rigged boats. In winter they occasionally fish for cod on the Horse Shoe shoal, which is 15 or 18 miles distant from Cotuit. Only 30 or 40 quintals are usually obtained during the season. In April hand-line fishing for tautog, scup, bass, and bluefish is begun, and is continued until fall. Twenty-five gill-nets are set annually, from May to August inclusive. Six boats are employed in this fishery. Four drag-seines are also owned in Cotuit, and are used for the capture of bluefish. In 1877 twenty-five lobster pots were in use. The total catch in 1877 was as follows: Cod, 10,000 pounds; haddock, 2,000 pounds; bluefish, 30,000 pounds; scup, 2,575 pounds; sea bass, 2,000 pounds; tautog, 1,600 pounds; striped bass, 1,500 pounds; flounders, 6,000 pounds; eels, 1,000 pounds; menhaden, 1,200 barrels; and 500 lobsters in number.

Both soft clams (*Mya arenaria*) and quahaugs are to be found in the harbor, but no considerable fishery for them is carried on.

In 1878 the fishing was very poor. The fishermen did not average $50 during the whole season. Purse-seines were formerly used at Cotuit for the capture of menhaden.

Centreville is a small village situated about four miles west of Hyannis. The fisheries are carried on by ten men. Each man owns three gill-nets, which are used for the capture of bluefish. Two sweep-seines are also in use here. A menhaden purse-seine, used in spring to secure fish to be sold for bait, is owned here. A weir, worth about $500, was erected in March, 1879. About twenty years ago an artificial alewife brook was cut in a marsh near the village, into the narrow drains of which the fish naturally came. A company was formed under the name of the Nine Mile Fishing Company. In 1877 the brook paid 60 per cent. on the original capital of $1,000. In 1878, 320 barrels of alewives were taken out, a larger amount than usual. The fishing is carried on for two months, usually from the 1st of April to the 1st of June. The alewives are salted or smoked and consumed in the village, or sold in Hyannis, or sold fresh to the fishermen fishing on Nantucket Shoals.

78. THE FISHERIES OF SANDWICH AND FALMOUTH.

SANDWICH.—The village of Sandwich, although situated very near the water, is not and has never been, to any considerable extent, dependent upon the fisheries. There are three men who

earn their living partially by fishing. They do not ship any fish, but sell their catch in the village. They own two small bluefish gill-nets and a sweep-seine worth about $100, which is used in spring for the capture of mackerel. In fall and spring these men catch a few cod and mackerel with hook and line in the bay.

The Sandwich alewife-river, which forms a part of Monument River, yields annually from 400 to 1,000 barrels of alewives. The river belongs to the town, and each citizen of Sandwich Township is entitled to one barrel of alewives on payment of the trifling sum of from 35 to 70 cents, which serves as compensation for the men who catch the fish. The villages of West Sandwich and North Sandwich are inland, and do not participate in the fisheries. In the course of its history Sandwich has had three whaling vessels, the last of which was sold to Sag Harbor in 1864.

Cohasset Narrows is situated in the town of Sandwich, and is at the extreme northern end of Buzzard's Bay. The fishing at this end of the bay is followed only by sportsmen and by others who thereby furnish fish for home consumption. The State law prohibits the setting of any weirs or pounds from Bird Island light on the south to the extreme northern end of the bay. The Narrows is now receiving special attention, it being at the southern end of the proposed canal soon to be cut through from Cape Cod Bay on the north, the two bays being only 6 miles apart. A few years ago clams were plentiful at this point, but probably from having been overworked are now nearly exhausted. The amount taken from the flats of Buttermilk Bay during the season of 1879 was 800 bushels. During the next season 400 bushels were taken and were sold by peddlers to the inhabitants of the neighboring towns.

The villages of Pocasset, Monument, and Buzzard's Bay form a part of the town of Sandwich, and are situated on the eastern shore of Buzzard's Bay, near its head. The oyster fishery is the only fishery which engages the attention of the citizens to any considerable extent.

THE OYSTER INDUSTRY OF SANDWICH.—The following account of the oyster interests of Sandwich is from the report by Mr. Ingersoll:

"The Cohasset River divides the town of Wareham from the adjacent township of Sandwich, its neighbor on the south and east. Flowing into Buzzard's Bay from this Sandwich side are several rivers, and the shore is indented with numerous inlets and shallow ponds. Nearly all of these inlets were found by the earliest colonists occupied by beds of natural oysters, and most of these beds are still living and supplying seed for cultivation. That the Indians used the oysters extensively is shown, not only by tradition and analogy, but by abundant traces of former feasts in the shape of shell-heaps. Some account of the oysters of this region more recently, is accessible in a letter from Dr. J. B. Forsyth, written in 1840, to Dr. A. A. Gould, and printed in the first edition of the latter's Invertebrates of Massachusetts. Dr. Forsyth says that the aged men of the vicinity assured him that oysters had never been brought there from abroad up to that time (1840); that they grew so abundantly everywhere along the Sandwich shores 'that at low water you could at almost any point procure a bucketfull of them from the rocks.' Dr. Forsyth also mentions Wareham as an oyster locality. There was then a statute prohibiting a man from taking more than two bushels at one time for his own use, and forbidding their being carried out of town. 'The oysters,' says the writer, 'are generally collected by a few men, who bring them to the village and dispose of them at 50 cents a bushel for their trouble; and by selling half a bushel or a bushel to an individual the spirit of the statute is not violated. This may be repeated every day, until the desired supply is laid in. When placed in the cellar and fed from time to time with a little meal and water, they will sometimes keep good for months.'

"Buzzard's Bay is the new name for the railway station on the Old Colony line, known to all the people about there as Cohasset Narrows, because it is upon the narrowest part of the neck of

the peninsula of Cape Cod. The river flowing down past Buzzard's Bay station is the Monument, a clear, broad stream, up and down which the tide rushes with great force. 'Wild' native oysters inhabited this stream, but had been pretty nearly exhausted by constant raking, when the attention of the town authorities of Sandwich was called to the matter a few years ago. They caused a survey of this and the various other oyster waters of the township, and divided them off into 'grants' of different sizes, according to the character of the bottom, but none less than about an acre and a half in extent. These grants could be taken by any citizen of the town, under certain conditions, upon the payment of $2.50. If not improved within a year they reverted to the town. Each grant, as soon as taken, and no matter what the value of the stock upon it, was taxed at a valuation of $50.

"The people were quick to take advantage of these legal permits, and it was not long before nearly all space of value was appropriated, and wild speculation began; but it is only within the last three or four years that much business has been done, or systematic efforts at transplanting and stocking have been introduced. There are now about fifty owners on Monument River, Cohasset River, and in Little Bay, and a careful estimate of money invested gives $30,000 as the probable value of grants, stock on hand (November, 1879), and appurtenances. Many of the grants are as yet very slightly stocked with oysters.

"The Monument River oysters were famous in olden times for their superior quality and size. 'They opened well,' the oystermen said; that is, there was a large proportion of meat to the shell, which was thin, brittle, and much scalloped. The first idea was simply to hold, as proprietors, the seed which were caught upon the grants from the natural bed at the mouth of the river; and, to facilitate this catching, more or less dead shells have been thrown down. But the more enterprising planters have laid down great deposits of seed oysters, purchased chiefly in Wareham, and these are just now beginning to produce their legitimate returns, having grown to a marketable size. Some fresh seed is put down every year, but in addition to this, it is expected that large accessions will be made by spawn caught from the natural bed and from the spawning of the planted oysters. Since 1874, however, very little spawn has been caught. In that year a vast quantity appeared, but arrangements were not made to avail themselves of it.

"The amount of seed placed upon a grant varies with the pocket and theory of the owner, from 100 to 500 bushels on an acre; perhaps 200 bushels would be an average of actual planting. The seed from one to two years old is used and preferred. It is generally planted in the spring, when it can be bought for from 30 to 35 cents a bushel; but it is thought much better to plant it in the fall, although then from 60 to 80 cents is asked for the seed. It costs about 10 cents a bushel to throw down. The best bottom (found everywhere here) is hard sand, a little soft on top. The average depth of water on the beds is 3 feet; but some stock is planted where it is exposed or just covered at ebb-tide, the objection to this being the danger of damage from drifting ice, for the mere resting of the ice on the oysters is not usually harmful, provided they lie flat on the sand. The calculated cost of beginning business along this river now would be about as follows:

Present cost of good ground (1 grant)	$40
Seeding, 300 bushels at 50 cents	150
Sail-boat and row-boat	55
Beach, shanty, and furniture	40
Rake, tongs, shovels, and tools	10
Incidentals	65
Total	360

"One who is really going into the matter hopefully must expect about this outlay before he considers his grant in condition to yield. If he puts down shells for the spawn to catch upon, as he probably will, it will cost him about 10 cents a bushel.

"Formerly Virginia oysters were planted and bedded here, but did not do well. The prices received for these oysters, which are all picked over and shipped to Boston in good shape, vary from $3.50 to $6 a barrel. In 1878, the exports from the Buzzard's Bay station by rail were 138 barrels. Up to November 1, 1879, 240 barrels were sent, making 300 barrels a probable total for that year. Besides this, in 1879, much opening was done by the oystermen to supply the neighborhood market, and about 1,000 gallons of opened oysters were carried by express companies, in small packages.

"Another oyster locality in the town of Sandwich is Red Brook Harbor, 6 miles south of Monument River. The railway station is Pocasset, on the Wood's Holl branch of the Old Colony line. This harbor is an indentation of Buzzard's Bay, about 1½ miles long by one-third of a mile wide, and it is separated from the outer bay by an island. A branch of the harbor, also, runs up to a landing known as Barlowtown. The name Red Brook Harbor is derived from a little stream which flows into it, the bottom of which is tinged with iron-rust; but this brook does not freshen the water to any considerable extent. The bottom of the main part of the harbor is hard sand, and the water is nowhere more than 8 feet deep at low tide. In some portions rocks and eel-grass exist.

"On the southern shore of this harbor, about a mile from its head, exists a living bed of natural oysters, some 7 acres in extent, under protection of the town for public benefit. The oysters growing upon it are reported to be large, but not of extraordinary size, scalloped and roundish, differing in no respect from aged oysters grown after transplanting to another part of the bay. Excepting this natural bed, the whole harbor has been surveyed and divided into grants; all those good for anything have been taken up, and must now be bought at an advanced price, if any one desires to possess them. The largest owner is a Boston firm, reputed to have 75 acres, but beside it are a score of other proprietors, inhabitants of the shores. It is safe to say that $3,500 would buy out all the home interests in the whole tract, and $15,000 cover the total investment up to January 1, 1880. There is a spirit of progress here, however, which will lead to a great increase in the value of the property within the next few years. During 1878, for example, there were shipped from Pocasset station only 85 barrels; in 1879, 500 barrels.

"I spent some hours on these grounds with Mr. Edward Robinson, who exerted himself to make my visit instructive. He thought that one-half of the whole water-area was suitable for oyster cultivation, and all of this is now appropriated, though only a portion has yet been stocked. The seed is mainly derived from the native bed in the harbor and from the shores where the native spawn has 'set,' and is planted in the spring and fall. The only outside seed brought in thus far is 300 bushels from the Weeweantit River, across the bay; and 1,000 bushels from Somerset. The latter did not seem to do well. A long, sandy point runs out into the harbor here, which ebbs dry at low tide. This does not come into any grant, therefore, and hence is public ground for the gathering of seed. I saw upon the pebbly beach, in places, how abundantly this was to be had. Young oysters, at this season, from the size of a dime to that of a dollar, were strewed between tide-marks so thickly that you could hardly avoid stepping upon them, and they would survive the winter well in this exposure. These are gathered by everybody who wishes and placed upon their grants. In addition to this, many thousands of bushels of old shells have been laid down, the proper time to do this work being early in July, in order to have their surfaces clear and ready to

catch the spawn which begins to appear about that time. In 1876 when there was the last good quantity of spawn emitted, the shells had been put down in May, and by July were so slimy that the spawn did not set upon them. They learned wisdom by that, but no good year for spawn has occurred since. The seed is planted in varying quantity, but Mr. Robinson said he should put it down shoulder to shoulder, so as to pave the whole bottom, if he had enough. I saw tracts where the growing oysters lay so thick as to conceal the sand, and you could gather a bushel from a square yard of bottom. The natives consider the seed here better than that at Monument River, for it is rounder and less distorted. When the oysters are three to four years old, and ready for market, Mr. Robinson takes them up and lays them upon a wooden floor near his packing shanty, in water almost wholly fresh, which takes away the very saline flavor, fills them up in size, and makes them plump and hard. It is known as the 'fattening' process, after which they are ready for shipment. Bought from the boats, a dollar a bushel is paid for these oysters, but the freight to Boston and the barreling make them cost about $1.30 a bushel to the dealer.

"Here, as at Monument River, fishing is habitually done through the ice in winter. The method is to cut a large hole and use tongs. The oystermen do not complain of it as especially cold or unpleasant work. In order to keep the oysters from freezing, they dip the bag which they intend to put them in when caught, in water, and hold it upright until it freezes stiff. It thus stands conveniently open, like a barrel, and no wind can blow through its sides to the detriment of the contents."

FALMOUTH.—The town of Falmouth is situated in the southwestern extremity of Barnstable County, and occupies a territory about 10 miles square. It contains the villages of Waquoit, East Falmouth, Hatchville, North Falmouth, West Falmouth, Falmouth, and Wood's Holl. The southern coast line of the town is broken by many inlets, creeks, and shallow bays, through which large schools of alewives pass to their spawning grounds in the ponds above. At Wood's Holl there are two harbors suitable for vessels, and there are also two or three of considerable size in Buzzard's Bay, within the limits of the town, but they are of inferior character.

Waquoit, the most easterly village of the town, is situated at the head of a large and shallow bay or fiord. The only branches of the fisheries engaged in here to any considerable extent are the weir fishery, the herring fishery, and the eel fishery. The Waquoit weir, which, according to Mr. Thomas Phinney, is one of the oldest on Vineyard Sound, is owned by a stock company of nine persons. It is tended by five men, who, for their compensation receive one half of the fish caught. The weir is placed in position annually about the 1st of April, and is removed when the bluefish make their appearance, early in June. The larger proportion of fish taken in this weir are of the two kinds, menhaden and alewives. During the spring of 1880, about 350 barrels of menhaden and 140,000 alewives were taken, together with about 12 barrels of scup and 3 barrels of shad. The menhaden and alewives were sold to Gloucester fishing vessels for bait. These vessels lie off Falmouth and receive the fish fresh from the weir. The usual price obtained is from 75 cents to $1 per hundred. In 1879, 100 barrels of menhaden were taken. The weir is constructed entirely of netting, and, including boats and other necessary apparatus, cost about $1,000. It costs annually $200 to keep it in repair.

About sixteen years ago an artificial alewife-river was opened. The catch of alewives was small at first, but increased until eight or nine years ago, when the maximum quantity, about 180 barrels, was taken. In 1878 the amount decreased to 140 barrels. In 1879 and 1880 the catch was very small, amounting to only 7,000 or 8,000 fish. This sudden diminution was due, perhaps, to the fact that cranberry patches have been formed in the swamps bordering on the brook, which are flooded annually, destroying the ordinary flow of the brook. Alewives are first taken

in May. The stock of the company is divided into fifty shares. One of the stockholders bought the privilege of exclusive fishing in 1880, paying at the rate of 40 cents for every hundred alewives taken.

The eel fishery gives employment every winter to about one hundred men, belonging in Waquoit and East Falmouth. A large proportion of eels taken are caught in Waquoit Bay. About 300 barrels are shipped to New York annually.

Quahaugs are plenty in Waquoit Bay, and are gathered and eaten by the villagers, but none are shipped. It is estimated that about 500 bushels of quahaugs are annually consumed by the people of Falmouth town. At Waquoit there is some business done in "seed" oysters. According to Ingersoll, about 2,500 bushels of these oysters are annually raised here.

No considerable fisheries are carried on at East Falmouth except in winter, when about thirty or forty men engage in spearing eels. A few oysters are cultivated here. About 1,000 bushels of seed are annually planted, and about the same amount of oysters sold each year.

Hatchville is 4 or 5 miles distant from the water, and cannot be classed with fishing villages.

North Falmouth is a little village of about fifty families. The population is made up principally of retired captains of whaling and merchant vessels and their families. Many of the people are now farmers. There has never been any fishing business at this point. A few clams are dug and an occasional hook cast for scup or bass. Prior to twenty-five years ago the hills were covered with salt works.

Very little fishing is carried on at the village of Falmouth. A weir has been in successful operation here for about nine years, which gives employment to three or four men. The principal part of the catch in 1879 consisted of alewives and menhaden, about 90,000 fish of each species being taken. Considerable numbers of flounders, tautog, squeteague, and bluefish were also caught and sent to market.

Wood's Holl is a small village of about 530 inhabitants, situated in the extreme southwestern portion of Barnstable County. In addition to the dwellings, it contains several small churches, two or three stores, a meat and a fish market, and several other small shops. The large factory of the Pacific Guano Company is located here.

Of the male inhabitants only seven are regularly engaged in fishing, the remainder being employed in the guano factory, in farming and other minor pursuits. The total number of men employed by the guano company is about one hundred, but a large proportion do not belong in the village, and many reside here only a few weeks or months. There is one ship carpenter in Wood's Holl, but he finds employment in his legitimate business only at long intervals. Of sail-makers, riggers, caulkers, and other like artisans there are none. Four men are employed by Mr. Spindel, during the height of the fishing season, in icing and boxing fish.

The boat fishery is carried on by seven men from April until September, inclusive. As soon as cold weather begins the men cease fishing and betake themselves to other pursuits—piloting vessels to the guano factory, hunting, &c. Only three species of fish are usually taken, namely, scup, tautog, and sea bass. The total catch of each fisherman is about 15 barrels, or about 2,400 pounds. In addition about 6,720 lobsters are annually taken.

Two weirs are employed annually in the southern part of the village, in Buzzard's Bay, and two others further north, in Quamquesset or 'Quisset Harbor. All four are constructed of netting attached to poles, one being arranged after the square model. About twenty men, including those who ice fish, are engaged in the fishery. A great variety of fish is taken, and the proportion of the different species to the total catch varies largely in different years, but the principal kinds are scup, tautog, striped bass, bluefish, and flounders.

I.—THE DISTRICT OF NANTUCKET.

79. GENERAL REVIEW OF THE DISTRICT.

PRESENT EXTENT OF THE FISHERIES.—The county and district of Nantucket comprises the islands of Nantucket, Tuckernuck, Muskeget, and the two Gravelly Islands. The four last mentioned are very small, and lie at the west of Nantucket. The island of Nantucket is about 16 miles long, and has an average width of about 4 miles. It lies low; the highest point, the summit of Macy's hill, is only 91 feet above the sea. Until the year 1873 Nantucket had been, from its settlement in the seventeenth century, the seat of an important whaling business. The whaling fleet here in 1843 numbered eighty-eight sail; in 1850, sixty-two sail; in 1860, twenty-one sail; in 1870, eight sail. In 1873 only one vessel was owned here, but since that time there has been none.

The fishing business in this district now employs four small vessels and two hundred boats, and the entire number of men engaged in fishing or handling the products is two hundred and eighty-five. The capital invested is $27,120, and the value of the products is $29,546.

STATISTICAL SUMMATION FOR 1879.—The following statements give in detail the extent of the fishing interests of Nantucket district:

Summary statement of persons employed and capital invested.

Persons employed.	Number.	Capital invested.	Amount.
Number of vessel-fishermen	9	Capital in vessels and boats	$14,520
Number of boat-fishermen	271	Capital in nets and traps	5,100
Number of curers, packers, fitters, &c	5	Other fixed and circulating capital	a7,500
Total	285	Total	27,120

a Cash capital, $5,000; wharves, shorehouses, and fixtures, $2,500.

Detailed statement of capital invested in vessels, boats, nets, and traps.

Vessels and boats.	No.	Tonnage.	Value.	Value of gear, exclusive of boats and nets.	Value of outfit.	Total value.	Nets and traps.	No.	Value.
Vessels.							*Nets.*		
In food-fish fishery:							Gill-nets:		
Active	4	26.19	$1,600	$140	$800	$2,540	In boat fisheries	200	$2,400
Boats.							Haul-seines:		
In vessel fisheries	4		60			60	In boat fisheries	5	1,000
In shore fisheries	200		4,000	2,500	5,420	11,920	Total	205	3,400
Total	204		4,060	2,500	5,420	11,980	*Traps.*		
							Weirs, &c	1	200
							Lobster and eel pots	1,500	1,500
							Total	1,501	1,700

Detailed statement of the quantities and values of the products.

Products specified.	Pounds, fresh.	Pounds, prepared.	Bulk.	Value, prepared.
Grand total				$29,546
Fresh fish.				
Alewives	1,500			15
Bass, striped	10,720			1,072
Bluefish	394,000			11,820
Cod	20,000			300

Detailed statement of the quantities and values of the products—Continued.

Products specified.	Pounds, fresh.	Pounds, prepared.	Bulk.	Value, prepared.
Eels	5,000			$250
Flounders	3,000			45
Haddock	10,000			133
Herring	4,500			22
Pollock	8,000			32
Scup	1,200			36
Swordfish	1,500			45
Mixed fish	150,000			750
Total	609,420			14,520
Dry fish.				
Cod	750,000	300,000		10,800
Haddock	131,580	50,000		1,000
Pollock	102,439	42,000		714
Total	984,019	392,000		12,514
Pickled fish.				
Alewives	8,000	6,400		128
Blue fish	9,750	6,000		150
Mixed fish	3,000	2,000		50
Total	20,750	14,400		328
Smoked fish.				
Bluefish	6,000	2,000		100
Shell fish.				
Lobsters	11,250			412
Clams:				
For food			475 bushels	237
For bait			1,778 bushels	635
Quahaugs and sea clams			400 bushels	200
Total				1,484
Miscellaneous.				
Fish oil			1,500 gallons	600

80. NANTUCKET AND ITS FISHERIES.

THE FISHERIES IN 1879.—The village of Nantucket is situated at the central point of the northern shore of the island, near the mouth of a large harbor which extends in a northeasterly direction for several miles. About two hundred and fifty of the men are fishermen. The village contains churches, several hotels, numerous stores and shops, and two fish-markets. Several of the streets are paved, and a number of the buildings are of brick, so that the place, in a limited area, presents the appearance of a small city. Communication is had with the mainland by boat every day during the summer and three times per week in winter. The boat touches at Martha's Vineyard and at Wood's Holl and New Bedford. There is a small hamlet at Siasconsett, at the southeastern part of the island, and the islands of Tuckernuck and Muskeget are inhabited, at least in summer, by a few fishermen.

The principal fisheries now carried on at Nantucket are for cod, haddock, pollock, bluefish, scup, eels, lobsters, and clams. The fishery for cod, haddock, and pollock usually begins late in September, or at the beginning of October, and lasts until January if the weather permits. It ceases then, but begins anew late in March, and is continued to June. About two hundred men are engaged in it. They go 1 or 2 miles, sometimes even 4 miles, off the south shore in dories. About one-half of the men go alone in their boats, but the remainder go by twos, so that the num-

ber of dories employed does not exceed one hundred and fifty. The majority of the fishermen use hand-lines exclusively, but about forty trawls, each with 200 to 400 hooks, are brought into use, chiefly in winter. About 400 quintals of cod are annually dry-salted, 18,000 or 20,000 pounds sold fresh, and the remainder pickled.

The fishery for bluefish and scup usually begins in June and continues until the latter part of September. Some sixty men are engaged in this fishery, of whom perhaps one-third use gill-nets for bluefish. About 150 gill-nets are employed. Those fishermen who set nets go alone, but those using hand-lines usually go in pairs. The principal fishing grounds are off the south shore of the island. In 1879 about 400,000 pounds of bluefish and 1,200 pounds of scup were caught. The larger proportion of the fish are shipped by two firms to whom the fishermen sell them. About one-half of the whole amount is shipped to Boston, and the remainder goes to New York, Philadelphia, Hartford, Providence, and New Bedford. Between 4,000 and 5,000 pounds of eels are annually taken at Nantucket.

There are four men at Nantucket and six at Tuckernuck who make a business of fishing for lobsters, and in addition ten or eleven others are engaged in it at different times. Each man sets from 30 to 60 or 70 pots. In 1879 the total catch was 11,250 lobsters. The lobsters are kept in live-boxes, and sold to a smack which comes from New York once in about ten days. In 1879 about 250 bushels of sea-clams, 475 bushels of shore-clams, and 150 bushels of quahaugs were gathered. In 1878 a wier worth $100 was set in the harbor, but no fish were taken. In 1879 its shape was altered so that the bowl could be pursed, and it was set farther toward the east. The result was as before, however; no fish were taken, although the weir was placed in a spot where many fish have been caught at other times.

HISTORICAL SKETCH OF NANTUCKET FISHERIES.—The fisheries of Nantucket have altered very much in character since the beginning of the last decade. In 1870 fifteen fishing vessels were owned here, and were engaged in the cod and mackerel fisheries. The business had not been prosperous, however, and in 1869 the question of selling the vessels was raised. At the beginning of 1870, however, there were apparent signs of improvement, and the number of vessels employed remained the same. But it seems to have been only a temporary gain, for in 1871 only five vessels were registered. The next year only three were employed, in 1873 two, and in 1874 none. The next year, however, one vessel was employed in the fisheries, but in 1876 it disappeared from the register, and the same was repeated in 1877 and 1878.

In the fall of 1869 not only did the offshore fishery prove unprofitable, but the inshore cod fishery failed to an alarming extent. Fortunately, however, for the welfare of the people, extensive beds of sea-clams were discovered on the bars and shoals outside the harbor. During the winter of 1869–'70, the fishermen found lucrative employment in gathering these clams and shipping them to Gloucester and other ports for bait. In two days in January, 1870, the steamer took from the island 96 barrels of clam bait, worth $1,000. This business is still carried on, but the clams have grown more and more scarce every year.

In 1871 there were only 70 or 75 bluefish gill-nets in use, but fish were scarce, and many fishermen attributed the cause of that scarcity to the destructive tendency of the nets. It is a fact, however, that although prior to 1870 bluefish were taken in large numbers on the north side of the island, soon after that date they became more and more scarce there, and since then nearly all that have been sent to market have been caught off the south shore. Every year, until recently, a number of barrels of bluefish were pickled.

Scup, which 15 or 20 years ago were abundant in the harbor, and were caught in abundance by the old men and boys off the wharves, are now very scarce, and few find their way to market.

The whale fishery, which has now died out at Nantucket, but which was formerly the chief source of the wealth and prosperity of the town, began in 1690, in boats from the shore. In 1712 the first sperm whale was taken by a vessel accidentally blown a considerable distance from the land, and a new and powerful impetus was given to the business. In 1715, an old record* tells us, six sloops, 38 tons burden, obtained about 600 barrels of oil and 11,000 pounds of bone, worth £1,000. But, if we may believe the statement of Zaccheus Macy, these vessels must have been employed near shore. Macy says:†

"In the year 1718, the inhabitants began to pursue whales on the ocean in small sloops and schooners from 30 to 45 tons."

From the old record cited above we learn the tonnage, and the amount of the fares, and their value, from 1730 to 1785. The summary is as follows:

1730. 25 sail, from 38 to 50 tons, obtained annually about 3,700 barrels, at £7 per ton		£3,200
1748. 60 sail, from 50 to 75 tons, obtained 11,250 barrels, at £14		19,684
1756. 80 sail, 75 tons, obtained 12,000 barrels, at £18		23,600
N. B.—Lost ten sail, taken by the French, and foundered.		
1770. 120 sail, 75 to 110 tons, obtained 18,000 barrels, at £40		100,000
From 1772 to 1775. 150 sail, from 90 to 180 tons, upon the coast of Guinea, Brazil, and the West Indies, obtained annually 30,000 barrels, which sold in the London market at £44 to £45		167,000
N. B.—2,200 seamen employed in the fishery, and 220 in the London trade.		
Peace of 1783. 7 sail to Brazil, from 100 to 150 tons, obtained	2,100	
5 to the coast of Guinea	600	
7 to the West Indies	560	
	3,260	
At £40 per ton		13,280
N. B.—No duty exacted in London.		
1784. 12 sail to Brazil, obtained	4,000	
5 to the coast of Guinea	400	
11 to the West Indies	1,000	
	5,400	
At £23 to £24		14,500

N. B.—The price fell by the exaction of a duty in London of £18.30 sterling per ton.

1785. Now at sea: 8 to Brazil, 2 to the coast of Guinea, 5 to the West Indies.

The number of vessels engaged in the fishery in 1807, is recorded in the following language:

"The rest (forty-one) of the (forty-six) ships are employed in the whale fishing, viz: Eleven on the coast of Brazil, eleven at the Cape of Good Hope, one on the coast of New Holland, and eighteen in the Pacifick Ocean." ‡

The absorbing attention paid by the Nantucket people to the pursuit of whaling, seems to have caused a partial neglect of other branches of the fisheries. The cod and mackerel vessels accumulated incidentally, so to speak, during the prosperity of the whaling business. With the decline of whaling, the people naturally turned their energies to other branches of the fisheries.

Fish seem to have been abundant in the waters about the island. Bluefish were plenty from the first settlement of the island until the year 1764, when, for some reason, they suddenly disap-

*Progress of the Whale Fishery at Nantucket, written in the year 1785, Coll. Mass. Hist. Soc., III, 1st series, 1794, p. 161.

†A short journal of the first settlement of the Island of Nantucket, with some of the most remarkable things that have happened since, to the present time. By Zaccheus Macy, 1792. Coll. Mass. Hist. Soc., III, 1st series, 1794, pp. 157-159.

‡Notes on Nantucket, August 1, 1807, Coll. Mass. Hist. Soc., III, 2d series, pp. 29, 30.

peared. In 1807 fourteen vessels were engaged in the cod fishery, of which one was a brig; seven, schooners; and six, sloops. In a note on the condition of the town, in this same year, it is stated that bass, shad, and alewives were abundant in Maticut Harbor, at the eastern extremity of the island, where the first settlement was located, and that "a fishery *might* be carried on here to great advantage; at present 400 barrels are taken annually." This shows, apparently, that at this period the shore fisheries were but little developed.

The manufacture of salt was attempted early in the century, but the fogs which are prevalent on the island prevented the successful carrying out of this scheme and it was abandoned.

J.—THE DISTRICT OF EDGARTOWN.

81. REVIEW OF THE FISHERIES OF THE DISTRICT.

PRESENT CONDITION OF THE FISHERIES.—Martha's Vineyard, the Elizabeth Islands, and No Man's Land together constitute Dukes County, or the customs district of Edgartown. The Elizabeth Islands form a single township under the name of Gosnold. Martha's Vineyard is divided into five towns, namely, Edgartown, Cottage City, Tisbury, Chilmark, and Gay Head. In the fisheries of this district, with the exception of the whale fishery at Edgartown, no vessels are employed, but the entire industry is confined to the use of boats and traps. In point of value the whale fishery is the most important single fishery, the products in 1879 being valued at $47,414. The total capital invested in the district is $220,695, and the value of the products is $133,797. The number of persons employed is four hundred and thirty-four.

STATISTICAL SUMMATION FOR 1879.—The following statements give in detail the extent of the fishing interests of Edgartown district:

Summary statement of persons employed and capital invested.

Persons employed.	Number.	Capital invested.	Amount.
Number of vessel-fishermen	211	Capital in vessels and boats	$175,575
Number of boat-fishermen	213	Capital in nets and traps	9,720
Number of curers, packers, fitters, &c	10	Other fixed and circulating capital	a35,400
Total	434	Total	220,695

a Cash capital, $20,000; wharves, shorehouses, and fixtures, $15,400.

Detailed statement of capital invested in vessels, boats, nets, and traps.

Vessels and boats.	No.	Tonnage.	Value.	Value of gear, exclusive of boats and nets.	Value of outfit.	Total value.	Nets and traps.	No.	Value.
Vessels.							*Nets.*		
In whale fishery	7	1,446.82	$48,000	.....	a$80,000	$128,000	Gill-nets:		
Boats.							In boat fisheries	50	$600
In vessel fisheries	18	.....	1,800	.....	.....	1,800	Haul-seines:		
In shore fisheries	165	.....	37,255	$3,195	5,325	45,775	In boat fisheries	6	1,200
Total	183	.....	39,055	3,195	5,325	47,575	Total	56	1,800
							Traps.		
							Weirs	9	4,000
							Lobster and eel-pots	3,920	3,920
							Total	3,929	7,920

a Includes gear.

Detailed statement of the quantities and values of the products.

Products specified.	Pounds, fresh.	Pounds, prepared.	Bulk.	Value, prepared.
Grand total				$133,797
Fresh fish.				
Alewives	473,121			2,361
Bass, sea	12,000			720
Bass, striped	73,860			7,386
Bluefish	444,840			13,345
Bonito	92,000			2,760
Eels	60,000			3,000
Flounders	35,618			534
Frost-fish	25,000			500
Herring	26,315			132
Mackerel	3,262			43
Menhaden	13,454			57
Perch	12,000			360
Scup	98,827			2,965
Shad	1,612			81
Smelts	13,460			337
Squeteague	24,905			872
Sturgeon	1,000			30
Swordfish	6,000			180
Tautog	5,544			194
Mixed fish	392,000			1,960
Total	1,814,818			37,837
Dry fish.				
Cod	1,065,660	426,272		15,345
Haddock	30,739	11,681		234
Pollock	56,980	23,362		397
Total	1,153,399	461,315		15,976
Pickled fish.				
Mixed fish	6,000	4,000		100
Smoked fish.				
Alewives	96,875	58,125		1,453
Shell fish.				
Lobsters	773,100			28,317
Clams:				
For food			1,000 bushels	500
For bait			3,000 bushels	1,070
Quahaugs and sea-clams			300 bushels	150
Scallops			500 gallons	250
Total				30,317
Products of whale fishery.				
Sperm oil			35,122 gallons	29,678
Whale oil			16,317 gallons	6,363
Whalebone			4,728 pounds	11,063
Ivory			1,000 pounds	310
Total				47,414
Miscellaneous.				
Fish oil			1,500 gallons	600
Seaweed			100 tons	100
Total				700

82. MARTHA'S VINEYARD.

EDGARTOWN.—The village of Edgartown, with 1,303 inhabitants, is situated near the northeastern extremity of the island, at the head of a fine harbor of the same name. It was formerly a whaling port, and has several wharves, which, however, are now but seldom in use. About seventy-

five men are engaged in fishing. The principal fishery is the boat line-fishery. About fifty boats, one-third of them carrying two men, are employed. In spring, from April to the 1st of June, one-half of the boats are employed in the shore cod fishery, and the total catch amounts to about 250,000 pounds of cod. About the 1st of June the blue-fishing begins. All the boats are employed in this fishery for ten or twelve weeks, according to the condition of the weather and the abundance of the fish. A small number of striped bass are also taken by the bluefish fishermen. In November the boats are hauled up, and are not in use again until the latter part of March.

Two gangs of seiners, each composed of four men, are engaged from the 1st of June to the last of September in seining bluefish, bass, and other species. They employ two seine-boats, about 25 feet in length, and own four seines, each 150 fathoms long, and worth $300.

Every winter about 300 barrels of eels are caught, and some 15,000 lobsters are taken annually. Bluefish are usually sent to New York either in ice or in smacks. Soft clams and quahaugs are abundant in the harbor, and are used by the fishermen for bait. The whale fishery, which has been prosecuted at Edgartown for many years, is still carried on. Seven whaling vessels are owned, which, with their outfits, involve a capital of $128,000.

Oak Bluffs, a village in Edgartown, is a well-known camp-meeting ground. There are also several hotels and boarding-houses annually resorted to by thousands of people, who spend much of their time in the summer months in fishing in the neighboring waters.

TISBURY.—Holmes' Hole, or Vineyard Haven, situated at the northeastern part of the town of Tisbury, is not at present extensively engaged in the fisheries, nor dependent upon them. Like Edgartown, the village is largely sustained by the wealth of the many retired captains of merchant and whaling vessels who have made their residence here.

In April and May, and again in October and November, four boats usually go from Holmes' Hole to No Man's Land to fish for cod. The average annual catch of each boat is about 10,000 pounds of cod. The fish are quite small, often weighing only 3 or 4 pounds. A cod weighing 40 pounds is considered very large. Five cat-rigged boats are employed in June, and also during portions of May and July, in the bluefish fishery with hand-lines. The total annual catch of bluefish is about 35,000 pounds. No person at Holmes' Hole makes his whole living by fishing, and even those who have been mentioned as fishing at different seasons let their boats in summer to pleasure parties.

There is an alewife-river near Holmes' Hole belonging to the town of Tisbury, from which about 150,000 alewives are annually taken. One-tenth, formerly one-sixth, of the catch is reserved by the town and sold to pay for the clearing of the river. This share is annually bought by Mr. Crowell. The alewives are chiefly sold to fishing vessels for bait, and are also in part sent to New Bedford.

NORTH SHORE OF MARTHA'S VINEYARD.—The northern shore of Martha's Vineyard, from Lombard's Cove, 5 miles to the westward of the West Chop of Vineyard Haven, to Gay Head, is occupied at irregular intervals by weirs. In 1880 there were two in Lombard's Cove, one three-quarters of a mile and one about 3 miles to the westward, and four in Menemsha Bight, near Gay Head. With the exception of one in Menemsha Bight, which has two leaders and two heart pieces, all are single weirs, having but one leader, heart, and bowl. All, without exception, are constructed of netting and poles. They are usually placed in position every year, about the last of May or the 1st of June, and are removed either before or not later than the 15th day of September. From two to four men are required to tend the weirs. The principal species of fish caught are scup, squeteague, bluefish, striped bass, bonito, tautog, mackerel, menhaden, alewives, sea-herring, and flounders. The larger proportion of the fish are sent to New York in ice.

via Wood's Holl, and in smacks. The managers of at least two of the pounds are accustomed to carry their fish in their own boats to Wood's Holl, whence they are shipped to market by Mr. Spindel. The menhaden and alewives, however, are usually sold to Gloucester fishing vessels for bait. The weirs vary in value from $200 to $400, but several of them originally cost from $800 to $1,000.

There exists on the western side of Menemsha Bight a hamlet of about 14 small temporary buildings, or shanties, as they are called, known as Lobsterville, in which a number of men, all or nearly all lobster fishermen, live during the summer. Forty boats were employed in the fishery in 1880, of which perhaps one-half carry two men. From each boat about 40 pots are set, and the total number of pots in use is about 1,600. In 1879 only fourteen boats and about 560 lobster pots were in use. Lobsters were much more abundant in 1879 than in 1880. In the former year the catch was 268,800 lobsters; in the latter year, about 200,000 lobsters. The season begins late in April and usually lasts about four months. At Gay Head there is a remnant of the former Indian possessors of the island.

83. NO MAN'S LAND AND ITS FISHERIES.

No Man's Land.—The island known as No Man's Land is situated south of the western extremity of Martha's Vineyard, at a distance of about 4 miles. It is a low, sandy island of very small proportions, and is uninhabited except by fishermen, all but two or three of whom remove to Martha's Vineyard at the end of the fishing seasons in spring and fall. While on the island they live in some 25 small houses, valued at about $100 each. The only fisheries are for cod and lobsters. The cod fishery, which is carried on for a few weeks in spring and fall, was engaged in in 1879 by about forty men, who employed some thirty-five boats. The cod taken during that year amounted to not more than 140,000 pounds when salted and dried. This is a much less quantity than was taken in some preceding years, but is more than has been taken since. There has been a constant diminution. The value of the apparatus employed, including boats, tackle, &c., and the single herring net carried by each boat amounts to not more than $6,000.

A number of fishermen, varying from twelve to fifteen or twenty, engage in lobster fishing every year. The number of lobsters taken has been decreasing, and in 1881 amounted to not more than 15,000 in the aggregate.

84. THE ELIZABETH ISLES.

Gosnold.—The Elizabeth Isles is a group of sixteen small islands that together constitute the town of Gosnold. They are separated from Cape Cod by a narrow channel, and extend 16 miles toward the southwest, forming the boundary between Buzzard's Bay and Vineyard Sound. The resident population of the group in 1870 was 99. Commencing toward Cape Cod, the islands are called Naushon, 8 miles long and 1½ wide; Pasque, about 2 miles long; Nashawena, 3 miles; and Cuttyhunk, 2½ miles. A narrow channel separates the islands. The island of Cuttyhunk was named Elizabeth Island by Gosnold, but that name is now given to the group. Until 1864 these islands belonged to the town of Chilmark. They are noted for their beauty and climate, and are a favorite summer resort of New Yorkers for boating and fishing purposes. Tarpaulin Cove, on the east shore of Naushon, is a harbor much frequented by wind-bound vessels on their way between Boston and New York. Some Noank fishermen come here in the summer for trap fishing. The product of their industry is included in the statistics for Connecticut.

Cuttyhunk Island is the most southerly of the Elizabeth Isles, and is about 2½ miles long and a mile broad. The land is high. It contains a hamlet of sixteen buildings, including the school-

house, and the buildings of the Cuttyhunk Club. About forty fishermen live here, many of them, however, only in summer. Three or four men fish for tautog with hook and line. The fishing begins in October and continues until snow comes. The total catch is usually about 3,500 or 4,000 pounds. Two small pounds are set at Cuttyhunk. They are usually put in position about the 1st of May (in 1880, on the 26th of April), and are taken up early in August. Four men tend them. The catch consists of scup, bonito, and sea-bass. In 1880, 350 barrels of fish were shipped to market, about one-half the quantity being scup and the remainder bonito. The catch in 1879 was about the same. In addition, in 1880, 10 barrels, and in 1879 60 barrels, of sea-bass were taken.

The majority of the fishermen, about thirty, are engaged in the lobster fishery. In 1880 six little smacks, with two boats each, and twelve other boats were employed. From each of the boats from 40 to 120 pots are set, the total number used being about 2,000. The fishery is carried on during four months. In 1880 the total catch of lobsters was between 200,000 and 240,000. The Cuttyhunk Club also sets about 120 pots. The large lobsters caught in these pots are sold, but the small ones are used by the club for bait.

K.—THE DISTRICT OF NEW BEDFORD.

85. GENERAL REVIEW OF NEW BEDFORD DISTRICT.

THE FISHERIES OF THE DISTRICT.—The New Bedford customs district comprises the towns of Wareham, New Bedford, Westport, and intermediate places on Buzzard's Bay. As will be seen by reference to the remarks on the various towns in this district, there are several kinds of fishing carried on, the most important being the whale fishery, which has had its headquarters in this region for many years. New Bedford is the principal place in the district and owns most of the fishing fleet. There is one small vessel in the district engaged exclusively in the lobster fishery. The fishery for cod, tautog, and other food-fish employs 22 vessels, the menhaden fishery 8, the seal fishery 1, and the whale fishery 128; the total tonnage of the entire fleet is 33,576.67 tons. The shore fisheries employ 210 boats, used in connection with the traps, or in the capture of lobsters and shell fish in various parts of Buzzard's Bay. The total capital invested in all branches of the fisheries and shore industries is $4,329,638, and the value of the various fishery products is $2,053,944. The number of persons employed is 4,287.

STATISTICAL SUMMATION FOR 1879.—The following statements give in detail the extent of the fishing interests of New Bedford district:

Summary statement of persons employed and capital invested.

Persons employed.	Number.	Capital invested.	Amount.
Number of vessel-fishermen	3,555	Capital in vessels and boats	$2,611,010
Number of boat-fishermen	385	Capital in nets and traps	23,028
Number of curers, packers, fitters, &c	238	Other fixed and circulating capital	a1,695,600
Number of factory hands	109	Total	4,329,638
Total	4,287		

a Cash capital, $1,260,000; wharves, storehouses, and fixtures, $270,500; factory buildings and apparatus, $165,100.

Detailed statement of capital invested in vessels, boats, nets, and traps.

Vessels and boats.	No.	Tonnage.	Value.	Value of gear, exclusive of boats and nets.	Value of outfit.	Total value.
Vessels.						
In food-fish fishery	22	490.13	$21,575	$1,090	89,700	$32,365
In lobster fishery	1	7.30	100	10	160	270
In menhaden fishery	8	520.46	52,500	575	7,200	60,275
In seal fishery	1	84.65	3,000	.....	5,000	8,000
In whale fishery	128	32,474.13	914,500	.....	a1,539,500	2,454,000
Total	160	33,576.67	991,675	1,675	1,561,560	2,554,910
Boats.						
In vessel fisheries	449	.....	44,140	.....	.....	44,140
In shore fisheries	210	.....	5,500	2,210	4,250	11,960
Total	659	.....	49,640	2,210	4,250	56,100

Nets and traps.	No.	Value.
Nets.		
Gill-nets:		
In boat fisheries	66	$1,640
Purse-seines:		
In vessel fisheries	15	6,500
In boat fisheries	2	800
Haul-seines:		
In boat fisheries	9	1,800
Total	92	10,740
Traps.		
Weirs, &c	29	11,100
Lobster and eel-pots	1,188	1,188
Total	1,217	12,288

a Includes gear.

Detailed statement of the quantities and values of the products.

Products specified.	Pounds, fresh.	Pounds, prepared.	Bulk.	Value, prepared.
Grand total	.....	.....	.....	$2,053,944
Fresh fish.				
Alewives	510,819	.....	.....	4,983
Bass, sea	56,000	.....	.....	3,360
Bass, striped	75,160	.....	.....	7,516
Bluefish	114,350	.....	.....	3,430
Bonito	5,000	.....	.....	150
Butterfish	5,000	.....	.....	150
Cod	95,000	.....	.....	1,425
Eels	199,221	.....	.....	9,961
Flounders	211,663	.....	.....	3,175
Frostfish	42,434	.....	.....	849
Halibut	4,500	.....	.....	158
Herring	7,645	.....	.....	38
Mackerel	393,000	.....	.....	5,227
Menhaden	12,740,084	.....	.....	19,110
Perch	3,476	.....	.....	104
Scup	296,923	.....	.....	8,907
Shad	9,344	.....	.....	467
Smelts	14,046	.....	.....	351
Squeteague	46,230	.....	.....	1,618
Sturgeon	1,500	.....	.....	45
Swordfish	342,800	.....	.....	10,784
Tautog	292,392	.....	.....	10,234
Mixed fish	108,800	.....	.....	544
Total	15,575,387	.....	.....	92,586
Dry fish.				
Cod	1,516,500	606,600	.....	21,838
Pickled fish.				
Alewives	150,000	120,000	.....	2,400
Mixed fish	12,000	8,000	.....	200
Total	162,000	128,000	.....	2,600
Shell fish.				
Lobsters	174,726	.....	.....	6,406
Oysters	.....	.....	16,200 bushels	21,225
Clams:				
For food	.....	.....	5,800 bushels	2,900
Quahaugs and sea-clams	.....	.....	5,100 bushels	2,550
Scallops	.....	.....	4,700 gallons	2,350
Total	.....	.....	.....	35,431

Detailed statement of the quantities and values of the products—Continued.

Products specified.	Pounds, fresh.	Pounds, prepared.	Bulk.	Value, prepared.
Products of whale fishery.				
Sperm oil			1,135,200 gallons	a$1,060,094
Whale oil			595,098 gallons	b257,086
Whalebone			242,476 pounds	567,393
Ivory			18,100 pounds	5,611
Ambergris			62¾ pounds	6,225
Total				1,897,609
Miscellaneous.				
Fish oil			2,700 gallons	1,080
Marine salt			210 tons	2,600
Seaweed			800 tons	800
Total				4,480

a Includes $101,400 enhancement in refining. *b* Includes $25,000 enhancement in refining.

NOTE.—The menhaden caught by New Bedford vessels were sold to oil factories in other States and are credited to this district at their value to the fishermen. Their enhanced value as oil and guano is credited to the States where the factories are located.

86. AGAWAM TO FAIRHAVEN.

AGAWAM STATION.—At Agawam station, in East Wareham, 3 miles inland from the northern end of Buzzard's Bay, is Half-way-pond River. This empties into the Wareham River, and the latter into the bay. Large bodies of alewives annually pass from the bay up these rivers to spawn, a considerable number being taken at East Wareham. The State law determines the time when they may be taken; this period is between April 1 and June 1. The exact time when they may be caught, the price at which they may be sold to citizens, and other regulations are left to a committee of three from each of the towns of Wareham and Plymouth. This committee sells the exclusive privilege of the catch at auction, and $400 to $500 a season is generally realized by the sale. The price which the citizens must pay is fixed by the committee at 16 cents a hundred fish, or 64 cents a barrel; one barrel is allowed to each inhabitant who may desire it. No fish may be sold to any except citizens for the space of two hours after the fish are caught, but after that time they may be sold to any person at such price as can be agreed upon. Provision is made that citizens shall always be able to obtain a limited supply at the price already mentioned, namely, 16 cents a hundred. The bulk of the catch is sold by peddlers through the neighboring towns. At the present time the catch is not more than two-thirds as large as it was a number of years ago. In 1880 the fisheries of this place gave employment to six men for 2 months. The catch was 700 barrels of alewives, worth $1,050.

Mr. Ingersoll gives the following report on the present condition of the oyster industry of Wareham and vicinity:

"About 5 years ago no oyster was better received in the Boston market than that from Wareham; it held the first place. Though it has lost this distinction by 'opening' poorly of late, it is still of fine quality and in demand by the neighborhood markets. Wagon-loads are sent off to Plymouth, Middleborough, and elsewhere, frequently through the winter; and during the season of 1877–'78 the Old Colony Railway carried 780 bushels in shell from the Wareham station, and about 150 gallons of opened stock. From East Wareham (Agawam station) there were shipped, during the winter of 1877–'78, 924 bushels in shell, while partial accounts of the next season (1879–'80) indicate a large increase. By far the larger part of the yield, however, is sold small, as 'seed

oysters' to be planted upon the beds along the eastern shore of Buzzard's Bay and the 'heel' of Cape Cod. This seed is never carried away to be sold, but the purchasers come after it in spring and fall in sloops of about 25 feet keel, locally known as 'yacht-boats'. This seed sells for 30 to 35 cents a bushel in spring, or 60 to 80 cents in fall, and is one and two years old, mixed. Some experiments have been made in bedding Virginia oysters through the summer, but although they lived well enough it was not found profitable. They brought only $4, while the native oysters would fetch $6, a barrel.

"Oyster affairs in Wareham can hardly be called a business. The title to the grants is very uncertain, the impression being that the right to operate upon them exists only through courtesy of the owners of the adjacent uplands, and a vast amount of litigation would probably arise if any one chose to object to the present status. This feeling, and the jealousy of anything smacking of monopoly, has deterred capital from being invested in any considerable degree, although efforts have been made to bring money from New York and Boston to bear upon this industry. At present the poor, ignorant, and shiftless portion of the community, for the most part, have to do with the oysters, and have found it necessary, in order to protect each other from a common thieving propensity, to decree among themselves that no man shall fish after sunset, even upon his own grant. It would be an outside estimate to say that 200 persons live upon the oyster in Wareham, at an investment of $3,000."

MARION.—Marion, formerly known as Sippican, is pleasantly located on the western side of Buzzard's Bay. It has a large and accessible harbor, in which are several islands. From the beaches of these islands, as well as from the shore of the mainland, are gathered clams, quahaugs, scallops, and oysters. At one time a fleet of twenty sail engaged in the whale fishery from this place, but at present the fleet numbers only two vessels, aggregating 175.38 tons, valued, with their outfit, at $12,900. A very small amount of any kind of fishing is carried on at present, and that by fifteen sail-boats, ten row-boats, twenty gill-nets, one purse-seine, and one drag-seine, having a total value of about $2,500. The number of persons employed, including the whaling crews, is fifty-nine.

The catch of the fishing boats consists mainly of menhaden, alewives, and bluefish. The catch of menhaden in 1877 was 2,500 barrels; in 1878, 8,000 barrels; in 1879, none; in 1880, 800 barrels. During 1879 4 shad and 11 striped bass were caught, but none in 1880. The yield of the shore fisheries in 1880 was valued at $3,965, and included 2,000 bushels of quahaugs, 1,300 bushels of soft clams, 500 bushels of scallops, 75 barrels of alewives, 20,000 pounds of bluefish, and 800 barrels of menhaden. In former years numerous vessels were built here, and for 40 years quite extensive salt manufactories were carried on. Neither of these industries has been prosecuted for several years.

The oyster interests of this region are thus reported by Mr. Ingersoll:

"Southwesterly from Wareham the head of Buzzard's Bay contains several oyster localities of varying importance. They are: The Weeweantit River, for a mile or so in the neighborhood of the highway bridge; Wing's Cove, and the Blankinship Cove of Sippican harbor, in the town of Marion.

"In the Weeweantit, natural beds of very good oysters have existed for a long time and a few years ago a large yield was obtained from them every year by Mr. Robinson and others. Latterly, however, the quantity has decreased, and the beds have been raked almost wholly for the sake of seed. There are grants here, but no improvement, as yet, of any consequence.

"In Sippican harbor (the harbor of Marion) it is said that no oysters were known until about the year 1864, when the shore of Ram Island, on the eastern side of the harbor, near the

entrance, was found strewn with young oysters, and the next year it was ascertained that these had lived and were growing. The whole cove rapidly filled, and the oysters at once began to be taken by the inhabitants in large quantities.

"Some gentlemen, in 1875, got permission of the town to plant oysters on the bar at the entrance of the harbor, and brought a large quantity of seed oysters from Somerset, Mass., to lay down there. Taking the hint, the town surveyed a fringe of grants around the whole harbor, which were rapidly secured by the citizens for purposes of culture. The first design was that all owning grants should seed them from abroad, leaving the natural beds in Blankinship Cove and all the channels as public domain. But this was done to a very small extent, the natural beds being raked and dredged, instead, for oysters to be placed upon the grants, until it seemed likely that no mollusks at all would be left upon the beds. Legislative measures, both of State and town, were brought forward for oyster protection, but with little avail, as restrictive measures had small support from public opinion, and now there is little attempt to restrain any one fishing to any extent. It is reported by some, as a consequence, that few oysters are left, while others say that there are as many oysters there now as ever. Meanwhile, those who had planted were not encouraged. The best grants lay in favorable spots, where the oysters had shallow water, a hard bottom, and quick tide, only lacking fresh water. One gentlemen has planted about 12,000 bushels, and has put down 6,000 to 8,000 empty shells, hoping to catch spawn; but since these were put down there has been no year in which the spawn was plenty at Marion. (The last good year for spawn in Wareham was 1877, in Somerset, 1878.) Both of these investments have proved to be losing ones. The oysters brought here from Somerset have grown pretty well in shell, but in meat are lean and watery. Last August those of marketable size produced less than two solid quarts to the bushel. This fall (1879) there has been an improvement, but a bushel does not 'open' more than 3 quarts. These facts are true, as a rule, over the whole extent of the harbor, and in every instance the owners consider that they have lost money on their investment, and that it is probable that no great success can be looked for in raising oysters at Marion, for unexplained reasons. Even when they succeed in getting a fair quantity of oysters, they are not as hard and plump as they ought to be, and will not sell in Boston market at prices which will repay the expense of their cultivation. Among special discouragements may be mentioned the burying of 2,000 bushels in one bed, on the outside of Ram Island Bar, by a single gale during the winter of 1878, and the sudden death of several thousand bushels up the harbor through anchor-frost. As a consequence, a large portion of the oysters which have been planted here from Somerset have been taken up and sent to Providence River, where they have been rebedded with great success. It may be that this will afford an opportunity for business, although planting will not succeed well. The seed can be bought in Somerset and laid down here for about 35 cents a bushel. Two years later it can be sold to Providence dealers for 75 cents. During these same years the natural beds near Ram Island have flourished tolerably well, although the large tracts of shells about the harbor have caught no spawn. They have not opened as much nor of as good quality, however, as formerly; but there are great differences in the oysters of even this limited area. A bed at Ram's Island, on the sand, in 3 to 5 feet of water, 'opened handsome,' while only a few yards away oysters on a muddy bottom were of poor quality and size.

"There have been about $17,000 invested in oyster culture in this town, but I believe the whole matter could be bought now for $10,000. Perhaps 5,000 bushels, all told, have been disposed of annually for the last three or four years at $1 a bushel or gallon."

MATTAPOISETT.—For nearly 125 years this place was a part of Rochester. On May 20, 1857, it was incorporated as a town under the old Indian name of Mattapoisett, which signifies "a place

of rest." In past years, up to a comparatively recent date, the inhabitants were quite largely engaged in ship-building and in the whale fishery, but very little attention is now paid to the fishing industry. Clams are plentiful, but the citizens only dig the few which they require for their home consumption. Fishermen from Fairhaven and New Bedford come here with teams and boats and dig large quantities, which they sell through the surrounding towns and cities. Alewives are taken in the Mattapoisett River, which enters Buzzard's Bay at this place. One weir is located 4 miles up the river, and two more at Rochester, 4 miles further up the river. For the past 10 years the catch has averaged 900 barrels a year. The catch of 1880, the smallest for twenty years, was 500 barrels taken at the lower station, and 200 at the upper. The greater portion of them are sold fresh through the neighboring towns. A local law fixes the price for a limited supply to the citizens of Mattapoisett, Marion, and Rochester, at 25 cents for a hundred fish. At the northeast entrance to the harbor, on Pine Island, are two weirs. These are fished by four men for six months in the year. At the fishing stations of Mattapoisett, Pine Island, and Rochester, in 1880, eleven men were employed for a part of the year. The total capital invested in boats, nets, and other apparatus was $2,130. The catch was valued at $2,275, and included 800 barrels of alewives, 2,000 lobsters, 200 barrels of menhaden, 1,000 squeteague, 8,000 tautog, 9,000 scup, 500 bluefish, and 25 Spanish mackerel.

FAIRHAVEN.—Fairhaven is bounded on the south by Buzzard's Bay, and on the west by Acushnet River. The various ways of spelling this name, found on the old records, are as follows: "Cushnet," "Acushnutt," "Acoosnet," "Acushena," and "Acushnett," or, as in use at the present time, "Acushnet." The bay at this point is nearly 1 mile wide, and is in fact an arm of the sea for the 3 miles from its mouth along the Fairhaven and New Bedford fronts. Above New Bedford it decreases in size to a small stream, no larger than a brook, and takes its rise near the south shores of Long Pond and Aquitticaset Pond, in the town of Middleborough, 10 miles distant. There are several islands in the stream; the largest is named Palmer, and is at the entrance to the harbor. The next to the north are Crow, Pope's, and Fish. This last is united to the long drawbridge connecting Fairhaven with New Bedford. Several other smaller islands, not named, add to the beauty of the river scenery.

The land now occupied by Fairhaven, New Bedford, and Dartmouth was purchased from the Indians in 1652, and was all united in the single town of Dartmouth, the part now called Fairhaven being known to the Indians as "Sconticut." On February 22, 1787, Westport and New Bedford were incorporated as separate towns. The latter embraced the present town of Fairhaven until April 22, 1812, when it was incorporated under its present name. The leading business of this place in past years was the whale fishery. Thirty-seven vessels, with nine hundred and forty-five men, sailed from here in 1837, and in 1858 forty-seven sail were engaged in that industry; in 1860, thirty-nine; in 1870, eight; in 1874, two; in 1876, two; in 1880, none.

Although the bay and river have always been noted as having an abundance and great variety of scale and shell fish, and the flats and near shores for miles have long been known to abound with quahaugs and clams, until lately there appears to have been but little attention paid to them, except in a small way for home use. Within the past twenty years, as the whale fishery has declined, more attention has been paid to the abundance of fish near home. At the present time two vessels, of 116.30 aggregate tonnage, engage in the cod fishery off Block Island, the New England shore, and as far as Banquereau; three small vessels, of 27.89 total tonnage (not registered), fish in the bay near home. At the southern end of the town, known as Sconticut Neck, within late years the business has steadily grown, the catch being made with gill nets, purse and shore seines. The weirs, of which there are fourteen located at the neck, are worth from $400 to $500

each. Each weir has a leader to the shore from 400 to 450 feet long. The average depth of bowl is 18 feet, with a diameter of 50 feet. The entire weir is made of twine and fastened to poles driven into the ground. The weirs are put down about the middle or end of March and are fished until the middle of July, when they are taken up. Some of them are again put down about the middle of August and fished until the 1st of November. Sometimes a few remain until December 1, for the sea-herring; these do not appear with any regularity, generally only once in about every four years. The fishermen pay a land-lease for their weirs of from $5 to $75 a season, according to the location. The catch is marketed fresh at New Bedford, New York, Philadelphia; a small part at Boston and other near cities and towns. The importance of the catch of the following species is indicated by the order in which they are named: Alewives, tautog, scup, squeteague, bluefish, and eels. The alewives bring in a half of the value of the total catch. During the season of 1880 menhaden, squeteague, tautog, and scup have been very plenty; Spanish mackerel and bonito scarce. Mackerel (*Scomber scombrus*) are seldom seen. They seem to know full well that there is no outlet for them at the eastern end of Buzzard's Bay, and therefore keep away. Of the immense schools that pass so near on their annual tour to the northeast, but very few are ever seen in the bay.

Thirty men, with small, unregistered sail-boats, fish from June 1 to November 1 with hand-lines in the river and in the bay near home. Their catch consists chiefly of tautog, eels, and scup, the eels being taken, for the most part, in small box-traps baited with clams.

That Buzzard's Bay abounds in a variety of fish, many of them valuable for food, others for fertilizer, has been shown in the foregoing remarks. We now add a complete list, kindly given us by Mr. D. W. Deane, who has been for twenty-five years in this business, and has for the past thirteen years been setting weirs in this locality. The list will be found of interest, as showing the date of the first catch of each species during the season of 1880:

"March 24, caught the first menhaden, alewife, smelt, tomcod, flatfish; April 1, tautog, skate, perch; April 6, sea-herring, eel; April 14, shad; April 15, striped bass; April 17, scup; April 24, dogfish, mackerel; April 26, rock bass; April 27, sea-robin; April 28, squid; May 8, butterfish, kingfish; May 11, squeteague; May 12, flounder; May 13, bluefish; June 8, stinging ray; June 7, sand shark; June 10, shark; June 25, bonito. On July 10 the weirs were taken up, and put down again August 26, on which day the first seres was taken. This is a gold-colored fish about the size of the scup, a very palatable fish. It is quite common some seasons during August and September. August 30, first Spanish mackerel; September 6, first razor-fish; September 6, first goosefish."

Mr. Deane says that striped mullet are quite abundant some years, but that there were none during the past season. No salmon have been seen this year. In 1879 five small ones were caught, but were returned to the bay, the State law not permitting any to be taken in weirs. Cunners have been plenty; hake and cod scarce. A dozen sheepshead have been taken during the season.

There is an ample opportunity for a large increase in this neighborhood in the fishing industry. The abundance of fish and proximity to all the great fish markets, as well as a large demand from the numerous near inland cities, make this a desirable point, and one which is capable of producing many times the number of fish at present obtained, most of the catch being now taken in from four to six months.

Fish of many kinds have been more abundant the past season than for several years. Their great abundance reduced the prices, which reduction, together with the effect of numerous severe storms and gales in the spring, has lowered the gross stock of the season's work of the weirs to a sum rather below that of 1879. Algæ is gathered from the shores of Sconticut Neck in great abundance at various times of the year. Twenty-five years ago but little attention was given to

it. Only a small amount was gathered, and that without charge, by any one who wished it. As its value became known, and more of it was gathered, a charge at the rate of 5 cents for a single-horse load was made. This was about 1860. In 1865 the charge had increased to 12½ cents a load, and at the present time 25 cents is willingly paid for the same amount. It is used as a fertilizer. Rock-weed and kelp are also used, and sold for $1 a ton. The latter, when mixed with other sea-weed, is worth only 75 cents. All fish not fit for market are saved, and find a ready sale at 30 cents a barrel for fertilizing purposes.

Thirty gill-nets are used by the fishermen at the Point. The catch consists of bluefish, tautog, scup, squeteague, dogfish, and sharks. Two shore-seines and one purse-seine are used for the capture of menhaden. The catch for the past season was 750 barrels, all of which was sold to the farmers at 30 cents a barrel. Clams and quahaugs are plentiful almost the entire distance of the west side of Buzzard's Bay from Cohasset Narrows to Sconticut Neck. Twenty-seven men dig them at various points, some going up the bay a short distance, and others, with teams, driving along the shore and filling their wagons, and selling the contents in the neighboring towns. The catch of lobsters here is small in size and amount. Most of it is used for bait in the capture of tautog, scup, and squeteague.

Fourteen men with ten boats dredge for scallops from the middle of October to the middle of January. Great quantities are found in the Acushnet River, as well as along all the western shore of the bay. A small dredge, holding about a bushel, is used. It is made with an oval-shaped iron frame 3½ feet in length. Wire netting is used in the front part and twine at the back. Small sail-boats, each with two men, fish with from one to twelve of these dredges in tow, sailing with just enough sheet to allow a slow headway. As soon as a dredge is filled, the men "luff up," haul in, empty, and go on. These little boats take from 10 to 75 bushels a day. If the breeze be unfavorable, one man takes the oars while the other tends the dredges.

The total number of persons employed in the Fairhaven fisheries in 1880 was 182. The capital invested in vessels, boats, weirs, and other apparatus was $22,725, and the value of the fishery products was $31,289. The catch of the vessels was 410,000 pounds of fish; of the weirs 375,000 pounds of fish. Twenty boats took 2,100 bushels of scallops, 2,800 bushels of clams, and 3,000 bushels of quahaugs. The other shore-boats, the seines, and gill-nets caught 30,000 lobsters, 200,000 pounds of menhaden, and 215,000 pounds of other fish.

In the Fairhaven Star of December 14, 1880, is the following historical review of the whaling business of that town:

"I will give the readers of your paper an account of the whaling business. I have made a list of the whaling vessels that have been owned and fitted from Fairhaven since the war with England. Peace was proclaimed on the 18th of February, 1815, and the ship Herald and schooner Liberty were fitted on a whaling voyage in the North and South Atlantic in the following July, of 1815; the only whaling vessels belonging to Fairhaven at that date. The next whalers added were schooner President, brig Agenora, ships Stanton, Pindus, Leonidas, and Amazon; these, with the schooner Talemacus, were the whaling fleet of Fairhaven in 1821, being eight in number. From 1821 they increased gradually until 1837, when there were thirty-seven vessels in the business, the tonnage being 11,654 tons. Value of sperm and whale oil imported, $296,958.56; whale-bone, valued $25,312.86; total, $322,271.42; men employed, 945; capital invested, $957,000. Population at the above date, 3,649. From 1837 to about 1850 the ships and barks increased to fifty that were fitted and hailed from Fairhaven. Averaging 28 men to each ship would be 1,400 men in the service; the tonnage of the ships, averaging 315 tons, would be 15,750 tons; capital invested, averaging $26,000 to a ship, would be, $1,300,000. The largest number fitted in any year were

twenty-three ships and barks, and one brig in 1838. Allowing 165 feet from after end of spanker boom to end of fly-jib boom, fifty ships in line would be over 1½ miles in length; 7 boats to a ship, would be 350 boats; 2,500 barrels cask each, 125,000 barrels.

"From 1835 to 1850, Fairhaven was a busy, thriving town. Persons not acquainted with the place at that time can have very little idea of the number of people employed in the ship yards, shops on the wharves, and about the village. Over one hundred mechanics and laborers were from their labor at noontime from Union wharf, and probably a larger number were employed on other wharves and in the village. In 1841 sixteen ships and three barks were fitted. In 1845 fourteen whalers arrived, with 15,525 barrels sperm oil, 11,625 barrels whale oil, and 100,300 pounds bone. The price of sperm oil in 1845 was 85 cents; whale oil 31 cents per gallon, and whalebone 33 cents per pound; value of sperm oil, $415,681.87; whale oil, $113,518.12; whalebone, $33,099; value of importations in 1845, $562,298.99.

"There have been some very good voyages both in sperm and whale oil. The most costly ship of the fleet was the ship South Seaman, costing $65,000; several others costing about $50,000 each. The last two owned in Fairhaven were ship General Scott and schooner Ellen Rodman. The ship Herald made twenty-five voyages, probably the largest number of any ship from this port, averaging 1,200 barrels each; total, 30,000 barrels. Ship Amazon made seventeen voyages, obtaining 5,014 barrels sperm oil and 28,980 barrels whale oil; total, 33,994 barrels. Ship William Wirt's largest cargo of sperm oil was 2,900 barrels. Ship South Seaman sent home 70 barrels sperm, 3,560 barrels whale oil, and 21,027 pounds bone. Lost on French Frigate Shoal March 13, 1859.

"In 1765 sloops Industry and Dove were engaged in the whaling business. In 1767 sloops Myriad, Sea Flower, Rover, and Supply were added.

"Before the war of 1812 ships Juno, President, Columbia, Herald (Samuel Borden, agent), Exchange (John Alden, agent), schooner Swan (John Alden, agent), were included in the whaling fleet of Fairhaven. When peace was declared in 1815 only one ship and one schooner fitted for whaling—ship Herald, agent Samuel Borden; schooner Liberty, agent John Alden. * * * Since 1815 one hundred and eight vessels hailing from Fairhaven have engaged in the whaling industry, classified as follows: eighty-eight ships and barks, eight brigs, and twelve schooners."

87. NEW BEDFORD TO WESTPORT.

NEW BEDFORD.—New Bedford is built on high ground, and the cross streets, running east and west, have an easy slope, affording a fine view of the Acushnet River and the harbor with its forest of masts of the whaling vessels. Fairhaven on the east and Buzzard's Bay in the distance on the south, make the view complete. New Bedford is the most important city on Buzzard's Bay, and in proportion to its population of 26,845, it is said to be the richest city in the United States. In 1877 its valuation in real estate was $12,609,200, and in personal property $10,854,900, or a total of $23,464,100.

The home fisheries have never been prosecuted with very great interest, although both scale and shell fish are in great abundance and close at hand. Considerable attention is now paid to supplying New York, Philadelphia, and cities nearer home with fresh fish, clams, quahaugs, and scallops. A small amount of fish is also sent to Boston. The vessels engaged in fishing are of small size, sloop or schooner rigged. They fish in Buzzard's Bay and the Acushnet River near home, where a great variety, similar to that spoken of in the report for Fairhaven, is taken. Scaled fish are caught with hand-lines, eels in box-traps, and scallops with dredges.

The menhaden fishery has been prosecuted from here for a number of years and has brought

in a large profit. Most of the catch was taken off the coast of Maine, where the fishing was carried on through the entire season. The fish have not been seen on their usual summer grounds for the past two years in any large numbers, and neither the early spring nor southern catch has paid expenses. The usual manner of running the steamers is as follows: The owners of the steamer furnish the vessel, engineer, fishing-gear, water and coal for the motive power, and the crew furnish their provisions, wages of cook, and board of fishermen. The captain hires his crew by the month or they go on shares. The owners receive one-half of the catch and the crew the other half. The master also receives an additional commission of from 5 to 7 cents a barrel. Steamers on Long Island Sound usually pay so much a thousand for the fish, 3⅓ barrels of fish to the thousand count. During 1879 the fleet from this port caught 55,700 barrels of menhaden, which were sold at the factories of Long Island Sound and Maine at 25 cents a barrel. During 1880 five of the steamers report a catch of 45,925 barrels of menhaden and 1,800 barrels of mackerel. The former sold at 30 cents a barrel and the latter sold fresh in the Boston market.

Scallops are plenty in the Acushnet River and large quantities are taken with dredges from October through the winter. The business has of late years greatly increased. When the season opens in the fall, about 2 bushels in the shell are required to make 1 gallon of solid meats, which weighs about 7 pounds. Scallops are always sold by the gallon.

Eels are found very plenty in the river and near creeks and bays. They are mostly caught in a box-trap of simple and cheap construction. This is 4 feet long, 10 inches wide, with slatted sides. There is a hole in each end 4 inches square. In the aperture are placed two small wooden slats. The eels slide in with ease, the slats opening as they glide in and immediately closing. The box is weighted with stones and baited with clams.

Thirty small sail-boats of sloop or schooner rig, of less than 5 tons each, and therefore not under license, are used by forty-five fishermen in the near home fishery. They catch their fish chiefly in Buzzard's Bay; it consists of tautog, scup, flounders, and eels, with a small amount of the other large species found in the bay. Many swordfish are caught in their season. The average amount of scallops taken every fall and winter is about 4,000 bushels. No fishing is carried on in midwinter.

The food-fish fishery of New Bedford employs fourteen vessels, aggregating 189.75 tons, and valued, with gear and outfit, at $13,990. In the menhaden fishery there is a fleet of seven steamers and one schooner, aggregating 520.46 tons, and valued, with their gear and outfit, at $69,276. Several vessels which obtained licenses in the general fisheries did not engage in that industry. They were mostly yachts that under those licenses were entitled to certain privileges not otherwise granted. One vessel of 84.65 tons, valued, with outfit, at $13,000, sailed in 1880 for the Antarctic fur-seal fishery.

New Bedford has for many years been the chief whaling port of the United States. The whale fishery was pursued here as early as 1755, and in 1765 four vessels were engaged in it. At the period of the Revolutionary war there were fifty to sixty vessels, but most of them were destroyed. After the war the business revived, but was again prostrated by the war of 1812. It was renewed in 1818, and the number of vessels gradually increased till 1857, when the New Bedford fleet numbered 324 sail, aggregating 110,867 tons. Various causes have led to a decline in this industry, among which were the panic of 1857, the destruction of thirty vessels by Confederate cruisers during the late war, and the loss, in 1871, of twenty-four vessels in the Arctic Ocean. Another and perhaps the chief cause of a decline was the substitution of cotton-seed oil and petroleum for whale oil. The great quantities in which these oils could be obtained made them so cheap that whale-oil dealers could not enter into fair competition for the trade. New Bedford

merchants have persistently continued this fishery and have managed to make it generally successful. The demand for sperm oil and whale oil, as well as for whalebone, will never entirely cease, for there are uses to which these products can be put that cannot be met by other oils or substances. There are in this city several large oil refineries and candle factories, where the oils are refined and the spermaceti made into large cakes for use in the arts or molded into candles. The whalebone is sent to the bone-workers in Boston and New York, where it is made into whips, corset and dress bone, and adapted to many other uses.

The whaling fleet of New Bedford at present numbers 123 vessels, aggregating 31,568.83 tons, valued, with outfits, at $2,414,000, and manned by 3,226 men. The catch of the New Bedford vessels and of the five vessels belonging to other ports in this district in 1879 was valued at $1,897,009, and included 1,135,260 gallons of sperm oil, 595,098 gallons of whale oil, 242,476 pounds of whalebone, 18,100 pounds of ivory, and 62¼ pounds of ambergris. In 1880 the oil aggregated about 1,865,262 gallons, and the bone about 380,364 pounds. The state of this industry in the city of New Bedford at different periods during the past forty years has been as follows:

Year.	Number of vessels.	Tonnage.	Barrels of sperm oil.	Barrels of whale oil.	Pounds of bone.
1840	174	.....	63,465	75,411	.....
1850	249	81,442	39,298	91,627	1,081,500
1853	318	107,512	44,923	118,672	2,835,800
1857	324	110,267	48,108	127,362	1,350,850
1860	291	98,760	43,716	90,450	1,112,600
1865	163	50,403	21,292	51,693	376,450
1870	176	50,213	42,886	49,563	569,861
1875	116	31,691	34,430	25,067	359,973

Exclusive of the whale fishery, the products of the fisheries for 1879 included 61,000 barrels of menhaden, 33,684 lobsters, 1,800 barrels of fresh mackerel, 824,200 pounds of tautog, flounders, and other fish, and 2,500 gallons of scallops, having a total value of about $50,000.

Clark's Point forms the southerly part of the city of New Bedford, the Acushnet River on the east and Clark's Cove on the west. Its length is about 2 miles. On the end of the point are a lighthouse and Government fortifications. Four pounds or traps are fished here. They caught in 1880 125,000 pounds of various species of fish valued at $2,200. The value of the traps is $2,000, and the number of persons employed is eight.

Concerning the oyster business in this vicinity, Mr. Ingersoll reports as follows:

"The Acushnet River, just above New Bedford, has been found wanting in the qualities necessary to make it good planting ground for oysters. The experiment has been tried, but has failed. No cultivation exists there, therefore.

"The principal dealers in the town buy yearly a superior stock of oysters in the Chesapeake Bay, bringing one cargo of 3,500 bushels for bedding, and another cargo for winter use; the schooner Hastings, of nearly 100 tons burthen, is the vessel used at present. These oysters cost 65 cents when laid down, but grow very little on these beds, since there is no fresh water to start them. In addition to this, one firm furnishes oysters from Providence River, Wareham, and elsewhere. The rest of the town, as calculated by them, use about 200 bushels and 100 gallons a week for five months. This makes New Bedford's estimated consumption, annually, about 13,000 bushels. Five men are employed six months as openers, at 17 cents a gallon.

"Just west of New Bedford is a little stream and inlet, known as Westport River. This was the locality of an ancient bed of native oysters, which has now nearly disappeared through too great raking. They are said to be very large and of good quality, but not more than 50 bushels

a year can now be caught throughout the whole 3 miles from the "Point" up to the bridge, which sell at $1.50 to $2 a bushel in New Bedford. There is reputed to be good planting ground near the bridge.

"A few miles west of Westport is the Dartmouth River, where, it is said, an oyster-bed has recently formed, but, as yet, is of little account. The bottom there, however, is regarded as very suitable for planting upon. Fifty bushels a year would cover the whole supply from here."

DARTMOUTH.—This port is situated on the western side and about half-way of the length of Buzzard's Bay. Four vessels of 163.03 aggregate tonnage fish from this port—two of them, on Banquereau and Western Banks for cod, and the other two near home, off Block Island and the New England shore, for cod and swordfish. Eight men are engaged in the lobster catch, setting their pots to the west of Cuttyhunk Island, 12 miles from home. Funnel-pounds (or bass-traps, as the fishermen call them) are set along the shore as follows: Apponagansett Bay, two; near Dumpling light, two; 1 mile west of Dumpling light, two; Mishaum Point, three. These pounds cost from $200 to $400 each, according to size, and are made of twine, with the exception of the end of the funnel, which is of wood. Some large pounds are in use at Dumpling light from April until August. They are owned by Mr. George Snell. By August the season is considered over and the pounds are taken up. The twine is made fast to poles driven into the ground. The poles are replaced each year, and the twine is not good for much after having been used for two or three seasons. The fish caught are alewives, menhaden, flounders, scup, and tautog, proprotionately in the order mentioned, with a few bluefish and shad. A State law forbids the taking of salmon. They are very seldom seen. At Dumpling light only two have been observed during the past five years. Menhaden are sold to the farmers at the rate of 30 cents a barrel for fertilizing purposes. Large quantities of unmarketable fish, such as skates, sharks, dogfish and others are taken and sold to the farmers for the same purpose at the rate of 85 cents a hundred fish, large and small. The livers of the dogfish, however, are removed and saved for their oil. The eatable fresh fish are sold fresh at New Bedford, New York, and Philadelphia, and the cured fish at Boston. The catch, by the pounds, during 1880, has been fully 75 per cent. larger in amount and value than that for 1879. The lobsters taken are shipped to New York.

There are salt works at South Dartmouth which manufacture 12,000 bushels of salt yearly from the water of Buzzard's Bay, which is pumped by windmills to the evaporating works. A much larger amount has been produced in past years. Most of the salt is used for home consumption, selling for 35 cents a bushel.

Dartmouth once owned a number of whaling vessels, but there is now only one vessel in this business. This vessel measures 231.59 tons and is valued, with outfits, at $20,000. The total amount of capital invested in the fisheries of this place in 1879 was $38,668, including the value of 1 whaling vessel, 2 bankers, 2 shore-fishing vessels, 4 shore boats, 9 traps and pounds, 238 lobster pots, and $4,100 in salt works. The products, exclusive of the whale fishery, were worth $20,050 and consisted of 598,600 pounds of fish, 50,000 lobsters, and 12,000 bushels of salt.

WESTPORT POINT AND WESTPORT.—Westport Point, situated on the western side, and near the mouth of Buzzard's Bay, was formerly of some note in connection with the whale fishery, and had a fleet of seventeen vessels engaged in it. Since 1876 that fishery has been abandoned at this place. Previous to the last three years more attention was paid to the near-home fishery than at present. The people here now engage in both fishing and farming. From April 15 to November 1, twenty-eight men, including the minister, fish between Sakonnet Point and Gooseberry Neck. They fish with hand-lines from the deck of small, sloop-rigged sail-boats, 13 to 20 feet long. From

September 15 to November 15 these men are joined by forty others, farm-work then being over for the season. The catch is composed chiefly of tautog, with a small proportion of bluefish, squeteague, rock-bass, striped bass, and others. In 1879 the first tautog was caught on June 21. During that season the largest striped bass captured weighed 60 pounds. For the past few years no salmon, Spanish mackerel or bonito, and but few squeteague, cod or hake—and less frequently still, a haddock—have been taken. Tautog have always been plentiful. Bluefish, striped bass, and menhaden show a decrease in the past 2 years' fishing. Eels are abundant and are caught chiefly at night with torch and spear. Lobsters are not numerous, and but little time is devoted to catching them. The fish are sold at Fall River and New Bedford.

On both sides of the Acoakset River clams are plentiful. Six men were engaged in working the beds during parts of seven months in the year 1879. Seven hundred bushels of clams were that year sent to market, and fully 1,000 bushels were used in home consumption. The abundance of clams has varied since 1870, being sometimes large, at others small. The yield of 1879 was not up to the average.

The fisheries of this place in 1879 gave employment to 71 men, and the amount of capital invested in 26 boats, 100 lobster traps, and other apparatus was $1,350. The value of the catch was $5,654, and included 3,000 pounds of striped bass, 47,900 pounds of tautog, 100 barrels of alewives, 17,200 pounds of eels, 35,500 pounds of assorted fish, 8,000 lobsters, and 1,700 bushels of clams. Most of the catch is sold at New Bedford and Fall River. Mr. David H. Bradley, who has been engaged in the fishing business at this point for twenty years, reports that not as many men are employed, nor as many fish caught, as when he first began business.

The following item from the Barnstable Patriot, June 21, 1859, shows the extent of the fisheries here at that date:

"GREAT FISHING.—Our correspondent at Westport Point writes us that the largest quantity of fish ever taken with the hook in one day at that place was taken on Friday. The fish numbered 1,333, and when dressed weighed 4,000 pounds. Two hundred and thirty-six fish, weighing 1,200 pounds, were also taken from gill-nets on same day, making in all 5,200 pounds. Those taken with the hook average 3 pounds each; those taken with the nets 5 pounds. There were 26 boats out, and the largest number taken by a boat was 122. The boats averaged about 50 fish."

At the western side of the bay from Westport Point, and distant from the point 1 mile by water and 8 by land, is the harbor of Westport. At one time a small fleet of fishing vessels and whalers sailed from here. At present there is no fishing vessel, though one whaler is owned here and fits at New Bedford.

The only attention paid in 1880 to fishing was by two fishermen during the summer. They used 500 fathoms of gill-net. The catch consisted almost wholly of bluefish, which were abundant until the 1st of August. In 1879 the catch of three men amounted to $645.50, and consisted of 16,020 pounds of bluefish, 700 pounds of striped bass, and 50 barrels of menhaden. The boats and nets used were worth $550. In 1880 two men with boats and nets worth $500 caught 17,500 pounds of bluefish, valued at $437.50.

L.—THE DISTRICT OF FALL RIVER.

88. GENERAL REVIEW OF THE DISTRICT.

IMPORTANCE OF THE FISHERIES.—The fisheries in this part of Massachusetts are confined to the capture of menhaden, shad, alewives, and a few other species, and shell-fish. In this district, which includes the neighboring town of Swansea, the fisheries of the Taunton and adjacent rivers, and, for convenience, the shad fishery at Holyoke on the Connecticut River, there is invested a capital of $104,930. The value of the product is $63,903, and the number of persons employed is 280. The oyster fisheries of Taunton River and Cole's River are of considerable importance, and for a few days during the height of the season, give employment to 400 men. About 52,000 bushels of oysters, valued at $23,000, are annually sold from the beds in this district. These are mostly seed oysters, which are sold for transplanting, and have not been considered as an actual product of the fisheries. The amount of native eatable oysters produced is 1,000 bushels, worth $1,200.

STATISTICAL SUMMATION FOR 1879.—The following statements show in detail the extent of the fishing interests of Fall River district:

Summary statement of persons employed and capital invested.

Persons employed.	Number.	Capital invested.	Amount.
Number of vessel-fishermen	101	Capital in vessels and boats	$40,585
Number of boat-fishermen	149	Capital in nets and traps	9,345
Number of curers, packers, fitters, &c	15	Other fixed and circulating capital	*a* 55,000
Number of factory hands	15	Total	104,930
Total	280		

a Cash capital, $15,000; wharves, shorehouses, and fixtures, $10,000; factory buildings and apparatus, $30,000.

Detailed statement of capital invested in vessels, boats, nets, and traps.

Vessels and boats.	No.	Tonnage.	Value.	Value of gear, exclusive of boats and nets.	Value of outfit.	Total value.	Nets and traps.	No.	Value.
Vessels.							*Nets.*		
In menhaden fishery	22	410.04	$21,900	$880	$6,600	$29,380	Purse-seines:		
Boats.							In vessel fisheries	11	$5,000
In vessel fisheries	24		2,340			2,340	Haul-seines:		
In shore fisheries	61		2,885	360	5,620	8,865	In boat fisheries	20	4,000
Total	85		5,225	360	5,620	11,205	Total	31	9,000
							Traps.		
							Weirs, &c	6	325
							Lobster and eel pots	20	20
							Total	26	345

Detailed statement of the quantities and values of the products.

Products specified.	Pounds, fresh.	Pounds, prepared.	Bulk.	Value, prepared.
Grand total				$63,903
Fresh fish.				
Alewives	135,000			1,320
Bass, striped	2,580			258
Eels	19,200			960

Detailed statement of the quantities and values of the products—Continued.

Products specified.	Pounds, fresh.	Pounds, prepared.	Bulk.	Value, prepared.
Flounders	3,000			45
Menhaden	12,800,000			19,200
Shad	a83,134			4,157
Mixed fish	10,000			50
Total	13,052,914			25,990
Pickled fish.				
Alewives	550,000	440,000		8,800
Mixed fish	3,000	2,000		50
Total	553,000	442,000		8,850
Smoked fish.				
Alewives	150,000	90,000		2,250
Shell fish.				
Oysters			1,000 bushels	1,200
Clams, for food			3,375 bushels	3,121
Total				4,321
Miscellaneous.				
Scallops			800 gallons	400
Fish oil			50,400 gallons	17,640
Fish guano			1,971 tons	4,450
Total				22,492

a Includes 53,636 pounds taken in the Connecticut River at Holyoke, Mass.

89. THE GENERAL FISHERIES OF FALL RIVER AND NEIGHBORING TOWNS.

FALL RIVER AND VICINITY.—Fall River is on Mount Hope Bay, an arm of Narragansett Bay, at the mouth of Taunton River, 45 miles from Boston. Its population in 1870 was 26,766; in 1880, 48,961. It is extensively engaged in the manufacture of cotton goods, and its factories contain more spindles than those of any other city in the United States. Railroads furnish communication with Boston, Providence, New Bedford, and other points, while daily lines of steamers run to Newport, Providence, and New York. The harbor is large and easy of access, and is deep enough for the largest vessels. The foreign and coastwise trade of Fall River is important. In 1873 thirty-seven vessels, aggregating 554 tons, were employed in the cod and mackerel fisheries, but in 1879 there were none. In former years whaling vessels were sometimes fitted here, but that fishery was abandoned many years ago. From 1840 to 1847 the whaling fleet numbered seven vessels, and from 1848 to 1860 two or more vessels were annually sent out; the last one in 1861.

The only fishery now carried on from here is for the capture of menhaden. In this business there are employed twenty-two vessels, including one steamer, aggregating 410.04 tons, and valued with outfits at $36,720. The catch of these vessels in 1879 was 12,800,000 pounds of menhaden, worth $19,200 in the fresh condition, and was sold to the oil and guano factories in this vicinity.

The shad and alewife fisheries of the Taunton River are carried on by 108 men, who use 29 boats, 15 seines, and 1 weir, worth, with their fixtures, about $7,500. The catch in 1879 was 1,718,000 alewives, equal to about 4,000 barrels, and 6,615 shad weighing 21,498 pounds. The value of these products was $12,090. A portion of the alewives were sold fresh, the rest pickled or smoked. The shad were sold fresh in Boston and other markets.

In Cole's River, in the town of Swansea, 4 miles west of Fall River, at the northern end of Mount Hope Bay, there is a small fishing station. The northern and northwestern ends of Mount

Hope Bay are valuable for their scallop and clam beds, which extend from Kickamuit River on the west to Taunton River on the east, a distance of 5 miles.

From 1875 to 1880 scallops were very plentiful. In 1880, however, grown scallops were quite scarce, while the beds were well supplied with the young shell-fish, thus giving promise of a good supply in the future. Nineteen men are engaged in the business, giving most of their time to catching shell-fish. When these are scarce, the fishermen visit the beds near Greenwich, on the opposite side of the bay. When these beds are yielding abundantly, other fishermen, from the Greenwich side, join in the business. In this industry small cat-rigged boats are used, each of which is equipped with four to eight dredges. The catch is opened at Swansea and forwarded principally to New York. During the summer Rocky Point and other resorts are supplied by these fishermen with clams of the summer yield, and Fall River and the local trade are furnished with clams from the winter digging.

Eels are plenty in Cole's river, and are taken in a conical basket-work trap, 2 feet long. The catch is sent to New York. A few fyke-nets are used in the winter, the catch—flounders—being used at and near home. Clams are worth $1 a bushel in summer, and 70 cents in winter. At the present time as many clams are used in summer as in winter.

The fisheries of Cole's River in 1879 gave employment to 19 men. The capital, invested in 6 small sail-boats, 40 scallop dredges, and 100 dories, amounted to $960. The products were worth $5,332, and consisted of 900 bushels of scallops, 3,375 bushels of clams, 19,200 pounds of eels, and 3,000 pounds of flounders. Besides these products there were about 1,000 bushels of oysters dug in this vicinity, valued at $1,200.

90. THE OYSTER INTERESTS OF TAUNTON RIVER AND VICINITY.

The oyster interests of the Fall River district, as reported by Mr. Ingersoll, are as follows:

"TAUNTON RIVER.—There lies in the Taunton River, at Dighton, a large rock, well known to archæologists, on account of some inscriptions which it bears; these, though untranslated, are supposed to be the work of Norse voyagers who early visited these waters. The foundation for this supposition is very fully and attractively stated in Thoreau's Cape Cod, to which the reader is referred. These earliest comers were pleased to find shell-fish abundant in the region, and the English settlers, three or four centuries later, record their thankfulness on similar grounds. From time immemorial, then, oysters have been natives of this district, and no such mistake as has been made north of Cape Cod could ever be put forward to deny that they are here indigenous.

"It was long ago recognized that the Taunton River was a valuable oyster-property, and legal measures were early adopted looking toward its preservation. The present plan of operations came into effect about thirty years ago, and though differing slightly in the various towns bordering the river, consists, in general, of the leasing of the ground for raking and planting purposes, during a term of years, at a fixed rental. Most of the towns do this under the general law of the State, but Somerset had a special act in her favor, passed by the legislature in 1847.

"The oysters from all parts of Taunton River (the producing extent is about 12 miles long) are known as 'Somersets.' Formerly they were considered extremely good eating, and grew to a large size. Within the last twenty-five years, however, they have assumed a green appearance and lost quality. It is popularly asserted, locally, that this is owing to the influence of the impurities discharged by the copper-works, by the rolling-mills, and by the print-works, which are situated some miles above the oyster beds. But this has been denied, on the ground that not enough of the mineral matter thus thrown into the current could get down there to affect the oysters so seriously, and also on the better ground, that chemical analyses fail to show the presence of any-

thing to account for the greenish stain, which is precisely that so highly esteemed a few years ago in the French oysters of Marennes, and other districts. I was assured that this greenness varied in different parts of the river, and with different seasons, and that if any oysters happened to have grown high up on the bridge-piers, or elsewhere off the bottom, they were not green at all. Just how deleterious to health these green Somerset oysters are, I could not learn satisfactorily. Nobody pretends that their effects are fatal, and some say they are as good as any other inferior oyster. The general opinion, however, is, that eating a dozen raw ones is certain to be followed by violent sickness at the stomach. No doubt prejudice has much to do with it, for there is no food which the imagination would more quickly influence the stomach to reject, than the soft, slippery, and somewhat insipid fresh-water oyster. The same green appearance occurs of late in the oysters of Seekonk River, to be spoken of later on; and in both cases transplanting entirely removes the stain and elevates the quality, which is said to be slowly improving. In consequence of this stain, the eating of Somerset oysters, in their natural state, has been nearly given up, and the whole trade of the river is devoted to the production and sale of seed. Of course no planting of any sort, beyond the occasional transference of 'set' from one part of the river to another, has ever been undertaken.

"The number of young oysters born every fall in Taunton River varies, but there is never a year wholly without them. The season of 1877 was a good one, and about ten years previous, the autumn of 'the great September gale,' saw an extraordinary production, or 'set,' as the appearance of the young oysters is termed here. The rocks and gravel along both shores are covered to a greater or less extent, but in addition to this every owner spreads down great quantities of clean shells every summer, in the hope of catching spawn. Generally, they are successful, and sometimes extremely so. Some experiments have been tried with sunken brush; but though the spawn attached itself well enough, the currents and winds are so strong and uncertain as to drift it all away and lose it to its owner. Perhaps 25,000 or 30,000 bushels of shells are spread in this river annually. The favorites are scallop shells, because they are thin and brittle, so that the young oysters anchored to them are easily broken apart or detached. Scallop shells are somewhat scarce, and 3,000 bushels put down at Assonet in 1878 cost $300. The result, nevertheless, is often very gratifying. Mr. S. R. Higgins told me that from 500 bushels of shells placed near Fall River he took up the following year 3,500 bushels of young oysters. The annual product, in seed, of the different town fronts along the river is given approximately as follows:

	Bushels.		Bushels.		Bushels.
Berkeley	11,000	Somerset	6,000	Assonet	13,000
Dighton	3,000	Freetown	10,000	Fall River	8,000
Total "Somerset seed"					51,000

"Putting an average value of 45 cents a bushel on this (the sales of the Somerset Oyster Company in 1879 netted them 42 cents), gives the sum of $22,950 as the value of the yearly crop of Taunton River seed. Of this, $5,400 is paid as revenue to the towns, and the balance mainly to native assistants in dredging, tonging, and transportation. The river towns may therefore be said to derive about $20,000 as the annual value of their fisheries to them, besides the oysters needed 'for family use.' This money is widely distributed. While the law permits the raking of the river during nine months of the year, it is nevertheless the fact that the main part of the work must be done in a much shorter time. As soon as the weather permits, or about April 1, the proprietors put gangs of men at work, and keep at it until the end of May. The catch is nearly all

contracted for before it is caught, and every owner is straining to fill his orders at the promised time. The water is from 3 to 20 feet deep, and the tonging not very difficult. The tongs used do not work by the twisting of the grain of an oaken pivot, but on a brass swivel-pivot, known as the 'Somerset' tongs. All, however, do not approve of the invention, averring that it wears out the tongs. During the months of April and May about sixty persons are employed in Somerset alone, and in other towns in proportion—perhaps four hundred along the whole river—who, as a rule, live along the bank, and often own the boats they operate; if not owned, one is hired from their employer at 25 cents a day. The catching is all done by the bushel. Now from 10 to 15 cents a bushel is given, according to the scarcity of the mollusks, and a smart man might make $2 a day, though the average will not exceed $1.50. Formerly wages were higher, and perhaps the lowering has induced that constant effort on the part of the catchers to cheat the buyers, through false measures, &c., which is so freely charged against them.

"The ground is cleaned up pretty thoroughly by the time the 1st of June is reached, and in the fall little raking is done, it being considered poor policy. A well-known lessee on the Freetown shore, however, thinking, at the expiration of his lease a few years ago, that he would be unable to renew it, resolved selfishly to dredge his whole land in the autumn, leaving as barren a ground as possible for his successor—a proceeding quite characteristic of the locality. He did so, but succeeded in renewing his lease, and returned to his raking the ensuing spring rather ruefully, expecting to find little or nothing. To his astonishment, he picked off an area that had usually yielded him 6,000 to 7,000 bushels no less than 12,000! Hence he concluded that the thorough scraping had done the bottom good, though where he got the spawn at that late day is a mystery. This small seed, less than a year old and about the size of your thumb-nail, is widely distributed, going to beds on Cape Cod, in Buzzard's Bay, along the southern shore, and in all parts of the Narragansett. It is highly esteemed on account of its hardiness. Wonderful stories are told of the cold and heat, drought and exposure, water too salt and water too fresh, which it has survived and prospered under. There is no difficulty about selling to planters all that can be raised, and the present high prices are due to the rivalry which has been brought about between buyers. The vessels which come to carry it away are small sloops and schooners of 30 or 40 tons, which carry from 300 to 1,000 bushels. None, I think, is sent anywhere by rail. Starfishes nowadays are few in Taunton River; but the borers (*Urosalpinx cinereus*) are growing more and more numerous and troublesome.

"SWANSEA.—After leaving Taunton River, pointing westward, the first point at which oysters of any commercial consequence are met with is in Cole's River, which flows into Mount Hope Bay, almost on the boundary between Massachusetts and Rhode Island. It was known long ago that oysters had inhabited this stream, and also Lee's River, near by, and immense dead shells are occasionally brought to light, but it had almost been forgotten until a few years ago, when there was suddenly discovered near the mouth of the inlet a large bank of living oysters of fine quality. Everybody at once rushed to rake them up, evading or discarding the special law enacted in 1867 for the protection of the oyster-beds in these very rivers.

"The result of this onslaught was, that two or three seasons of it nearly extirpated the colony, and the few to be obtained now are only got by hard effort on the part of a few professional rivermen, who peddle them in the neighborhood or take them to Fall River.

"The extensive banks and tide flats of this river, however, have long abounded in young oysters, which were buried by the digging for clams, which is extensively carried on here, or frozen by the winter weather, so that few, if any, survived, and none to speak of were gathered. Lately a large gravel bank has been thrown up by the changed currents against the pier of the railway

bridge, and the number of infant mollusks attached to the pebbles here became so great as to attract the attention of Providence oystermen, who have created a demand for this seed. It is therefore gathered and sold now; about 1,000 bushels, it is estimated, having been collected during 1879. This is hardy, of good shape, and produces a round and remarkably fine oyster. Some attempts have been made at Cole's River to plant and rear its own oysters, and the town granted areas for this purpose, but they have not been successful thus far. Litigation has resulted in several cases from a clashing of alleged rights, and anchor-frost and starfishes, or drifting sand, have done the rest. I fear it is not a favorable locality for this purpose."

Statistics of oyster interests in Fall River district.

Number of planters (not counted elsewhere)		10
Extent of producing area	acres	13
Number of men employed (a few days in spring)		400
Value of shore property and cultch		$5,000
Number of boats employed		250
Value of same		$5,000
Annual sales of native oysters	bushels	52,000
Value of same		$23,000