5.—REPORT ON THE FISHERIES OF THE NEW ENGLAND STATES.

BY J. W. COLLINS AND HUGH M. SMITH.

I.—GENERAL REMARKS AND STATISTICS.

The fisheries of the New England States are so well defined as to their character, methods, etc., and form such an important part of the industrial life of that section, that it is deemed proper to present a special paper dealing with their various phases, in order to exhibit their extent and condition in greater detail than would be practicable if the entire coast of the United States were under consideration.

The information herein given is similar in general scope, character, and arrangement to that contained in the "Statistical Review of the Coast Fisheries of the United States," recently published by the U. S. Fish Commission, but is much more detailed than ever before presented in the matter of minor civil divisions. It is thought that this feature of the paper will be received with favor, since it enables the reader to obtain the fullest statistical information concerning the extent of the fisheries in each coast county in New England. The material upon which the report is based was obtained by a personal canvass by agents of the U. S. Fish Commission of the 3,460 miles of coast line covered by the statistics. The report relates to the calendar year 1889 and includes the entire commercial fisheries of the New England coast. Under each State will be found a definite statement of the extent to which the various rivers were investigated; in general, however, it may be said that all streams were canvassed to the limits of economic fishing, and the report may therefore be regarded as a complete exposition of the fisheries and fishery industries of this section.

The tables have been compiled and arranged with the purpose of exhibiting the different phases of the fisheries under the following heads:

1. Civil divisions: A clear conception can be obtained of the relation of the fisheries, not only to each State but to each county along its coast.

2. The vessel and shore fisheries: These are exhibited in such a manner as to show definitely the extent and value of each.

3. The value of fisheries by apparatus: These tables show the relative effectiveness of each form of apparatus as applied to the fisheries.

4. The importance of the fisheries by species: Under this head are considered such fisheries as those prosecuted for the cod, the mackerel, the whale, etc.

5. An exhibit of the fisheries by fishing-grounds: These apply more particularly to the food-fish fisheries. The value to the New England fishermen of all the leading fishing-grounds is thoroughly demonstrated by showing the amount of products landed. No feature of this report is of greater importance than that embraced under this heading, since its consideration will show graphically and at a glance the relative importance of these fishing-grounds and will serve as a basis for the consideration of international questions bearing upon the fisheries. It will be seen that the fishing-grounds which are of greatest consequence to our fishermen are those in the open ocean or near our own coast. The grounds in the Gulf of St. Lawrence or in other waters immediately adjacent to Canadian territory are of comparatively minor importance.

6. Special phases of the fisheries, such as the average earnings per ton, per fisherman, per hundred dollars invested capital, etc.: This feature, inasmuch as it exhibits at a glance many of the salient points connected with the fisheries and furnishes a basis for comparing the importance of the various branches of the industry in each county, will doubtless prove of interest.

7. The importance of the bait fishery and the relative effectiveness of certain forms of apparatus in procuring bait.

8. The extent of the important shore industries: These include the branches dependent on the fisheries proper, as sardine and lobster canning, herring smoking, etc.

A brief explanation of certain features of the tables will contribute to a clearer conception of their scope. In the first place, in order to show clearly in one total the yield of different branches of the fisheries, it has been found necessary to reduce to the common unit of a pound certain products that are not usually handled on such a basis in the trade. In reading the tables, therefore, the following key, which covers all cases, should be borne in mind:

Oysters: The weight given is for the edible part (meats and liquor); 7 pounds to a bushel.

Round clams or quahogs (*Venus mercenaria*): Same as oysters; 8 pounds to a bushel.

Long clams or soft clams (*Mya arenaria*): Same as oysters; 10 pounds to a bushel.

Scallops (*Pecten irradians* and *P. magellanicus*): Weight of "eye" or muscle (the edible portion) is given; 3½ pounds to a bushel.

Oil (whale, seal, and fish): 7½ pounds to a gallon.

Idle vessels, boats, apparatus, and shore property are omitted from the statistics.

The boats carried on vessels are not shown separately; their value is included with the outfit of the vessels.

The classification of the fish is into fresh, salted, and smoked. Fish specified as salted are those which leave the vessels or the hands of the fishermen in the various states of preservation by means of salt. The smoked fish shown in the regular tables are only those which are so prepared by the fishermen; the smoking done at canneries and in smokehouses not used by fishermen has been considered to be a manufacturing enterprise and has been included under the head of shore industries. Canned fish are shown only as the products of manufacture and not of fishery. The quantities represent in all cases the weights as sold by the fishermen and, consequently, are considerably less than the weights which the products have when taken from the water. Thus, the fish classified in the tables as salted would, when round, weigh approxi-

mately twice as much as the amount given, and smoked fish lose about two-thirds the weight in the process of curing.

The values of products are in all cases based on the prices paid the fishermen, or the original cost.

The series of special tables for each State, which show in detail (by fisheries and fishing-grounds) the importance of the vessel fisheries, needs some little explanation. By the arrangement giving the extent of the fisheries by fishing-grounds each vessel is credited to all the fisheries in which it was engaged during any portion of the year, together with its tonnage, value, and crew; it is therefore duplicated to that extent, but no duplication of the catch occurs. The following definitions of the more important fisheries recognized will aid in giving a clear understanding of the tables:

Shore fishery: Vessels engaging in this branch are mostly small craft, about 5 to 50 tons, frequenting waters adjacent to the New England shore and catching so-called ground fish, which are sold either fresh or salted.

Market fishery: Vessels credited to this fishery are of medium or large size and take fish on the banks lying to the westward (Georges, Browns, etc.) or off the New England coast. The catch consists mostly of cod, haddock, pollock, hake, and halibut, and is landed in a fresh condition.

Halibut fishery: Vessels incidentally taking small quantities of halibut in the bank, market, and shore fisheries have not been classed under the halibut fishery, which designation has been reserved for vessels making special trips for that species and landing their fares in a fresh condition or fletched and salted. The other species taken while fishing for halibut are properly credited to this fishery.

Mackerel fishery: All vessels taking the common mackerel, with seines, hooks, or gill nets, are shown under this head. Alewives, menhaden, herring, shad, swordfish, and other species taken, in purse seines or by any other means, while catching mackerel are included in this fishery.

The other fisheries are self-explanatory.

In order that no misunderstanding may arise from the use of common or popular names in this paper, it is considered advisable to present in this place the scientific identifications opposite the common names.

Common names.	Scientific names.	Common names.	Scientific names.
Albacore (tunny or horse mackerel).	Albacora thynnus.	Frostfish (or tomcod).	Microgadus tomcodus.
Alewife	Clupea pseudoharengus and C. æstivalis.	Grouper	Epinephelus morio.
Bluefish	Pomatomus saltatrix.	Haddock	Melanogrammus æglefinus.
Bonito	Sarda sarda.	Hake	Phycis chuss and P. tenuis.
Bream (or redfish)	Sebastes marinus.	Halibut	Hippoglossus hippoglossus.
Butter-fish	Stromateus triacanthus.	Herring	Clupea harengus.
Catfish (or wolf-fish)	Anarrhichas lupus.	Hickory shad	Clupea mediocris.
Cod	Gadus morrhua.	Kingfish	Menticirrus nebulosus.
Cunner (chogset or perch).	Ctenolabrus adspersus.	Mackerel	Scomber scombrus.
Cusk	Brosmius brosme.	Menhaden	Brevoortia tyrannus.
Eel	Anguilla rostrata.	Pollock	Pollachius virens.
Flatfish and flounders.	Paralichthys dentatus, P. oblongus, Pleuronectes maculatus, Pseudopleuronectes americanus, chiefly.	Red snapper	Lutjanus blackfordi.
		Salmon	Salmo salar.
		Scup (or porgy)	Stenotomus chrysops.
		Sea bass	Serranus atrarius.
		Shad	Clupea sapidissima.
		Smelt	Osmerus mordax.

Common names.	Scientific names.	Common names.	Scientific names.
Spanish mackerel	Scomberomorus maculatus.	Crabs	Callinectes hastatus and Cancer irrorata, chiefly.
Squeteague (or sea trout).	Cynoscion regale and C. maculatum.	Lobster	Homarus americanus.
Striped bass (or rockfish).	Roccus lineatus.	Shrimp	Crangon vulgaris.
Sturgeon	Acipenser oxyrhynchus.	Clam (soft or long)	Mya arenaria.
Swordfish	Xiphias gladius.	Clam (hard, round, or quahog).	Venus mercenaria.
Tautog	Tautoga onitis.	Oyster	Ostrea virginica.
Whiting (or silver hake).	Merlucius bilinearis.	Scallop	Pecten irradians and P. magellanicus.
Terrapin	Malaclemmys palustris.	Squid	Loligo pealei.

The following tabular statements give a summary, by States, of the New England fisheries in 1889.

The first table shows that 36,536 persons were employed in the industry, of whom 15,122 were engaged in the vessel fisheries, 12,295 in the shore or boat fisheries, and 9,119 in various capacities on shore. In the number of vessel fishermen Massachusetts is much in the lead of all the other States, having 10,851 persons in this class. Maine takes first rank in the shore fisheries and shore industries, giving employment to 6,205 and 5,244 persons, respectively.

The vessels, boats, apparatus, shore property, and cash capital employed in the New England fisheries are next given. The table shows 1,542 vessels, with a tonnage of 79,738.49, valued, with their outfit, at $6,382,006. Massachusetts is credited with more than half of all the fishing vessels of New England, viz, 836, followed by Maine with 408, Connecticut with 214, Rhode Island with 69, and New Hampshire with 15. Of the 11,561 boats, valued at $657,010, used in the shore fisheries, Maine has 5,990, worth $237,469, and Massachusetts has 3,494, valued at $254,033. The apparatus employed in the actual taking of fish and other products was valued at $1,683,525, of which $692,638 represented trawl and hand lines, $442,960 weirs, pound nets, and trap nets, $190,276 pots, $183,220 seines, $104,309 gill nets, and $68,122 minor forms, including bag nets, fyke nets, harpoons, spears, dredges, tongs, rakes, etc. Of the total investment in apparatus of capture, Massachusetts has $1,009,621, Maine $423,564, Rhode Island $119,417, Connecticut $106,682, and New Hampshire $22,291. The capital invested in shore property of various kinds, as wharves, bui dings, flake yards, etc., amounted to $5,850,979, of which more than half is to be credited to Massachusetts. The amount of ready money required to properly conduct the fisheries, and known as cash capital or working capital, was $5,523,224, Massachusetts employing $4,284,200. The total investment in vessels, boats, apparatus, shore property, and cash capital amounted to $20,094,794, of which Massachusetts had $13,245,229, Maine $2,889,893, Connecticut $2,826,834, Rhode Island $1,020,178, and New Hampshire $112,660.

The third table shows the quantity and value of each species of fish and other marine products taken in each State. It is seen that, considering the New England States together, the cod is by far the most important species, being valued at $2,539,757, after which come oysters at $1,399,784, lobsters at $833,736, whale products at $828,463, haddock at $738,732, mackerel at $731,424, halibut at $725,756, and menhaden at $428,228. Regarding the quantities of products, menhaden rank first, with 173,632,210 pounds, followed by seaweed, with 149,553,900 pounds; cod, with 97,145,645 pounds; haddock, with 43,473,627 pounds; herring, with 36,316,259 pounds, and lobsters, with

30,449,603 pounds. The largest catch was made by the Massachusetts fishermen, who took 299,217,669 pounds, valued at $5,858,274. Maine ranks second, with 129,559,864 pounds, $2,111,206, followed by Rhode Island, with 127,365,475 pounds, $935,144; Connecticut, with 92,672,464 pounds, $1,557,506, and New Hampshire, with 4,354,568 pounds, $88,511. The combined catch of all the New England States was 653,170,040 pounds, worth $10,550,641.

1.—Table showing the number of persons employed in the fisheries of the New England States in 1889.

States.	Vessel fishermen.	Shore fishermen.	Shoresmen.	Total.
Maine	2,680	6,205	5,244	14,129
New Hampshire	141	194	30	365
Massachusetts	10,851	3,748	2,639	17,238
Rhode Island	388	896	473	1,757
Connecticut	1,062	1,252	733	3,047
Total	15,122	12,295	9,119	36,536

2.—Table showing the apparatus employed and the capital invested in the fisheries of the New England States in 1889.

States.	Vessels.							
	Fishing.				Transporting.			
	No.	Net tonnage.	Value.	Value of outfit.	No.	Net tonnage.	Value.	Value of outfit.
Maine	349	11,476.44	$523,690	$201,487	59	1,660.23	$75,475	$13,100
New Hampshire	15	588.05	32,000	11,000	.....	.....	.....	.....
Massachusetts	814	57,984.18	3,042,745	1,533,398	22	1,275.12	55,600	7,425
Rhode Island	62	1,402.05	194,325	26,385	7	82.74	2,625	400
Connecticut	200	5,052.60	512,155	134,652	14	217.08	13,395	2,050
Total	1,440	76,503.32	4,304,915	1,907,021	102	3,235.17	147,095	22,975

States.	Boats.		Apparatus of capture.									
			Pound nets, trap nets, and weirs.		Seines.		Gill nets.		Bag nets.		Fyke nets.	
	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.
Maine	5,990	$237,469	647	$99,917	131	$32,925	5,101	$48,373	280	$11,570	134	$550
New Hampshire	73	4,170	12	860	10	3,800	134	1,570	.....	.....	.....	.....
Massachusetts	3,494	254,033	224	222,583	293	124,845	4,177	44,212	.....	.....	15	100
Rhode Island	651	62,743	182	81,800	51	13,950	117	7,630	.....	.....	376	2,680
Connecticut	1,353	98,595	113	37,800	55	7,750	62	2,524	.....	.....	440	2,230
Total	11,561	657,010	1,178	442,960	540	183,270	9,591	104,309	280	11,570	965	5,560

States.	Apparatus of capture—continued.							Shore property.	Cash capital.	Total investment.
	Miscellaneous nets.		Lines (value).	Pots.		Harpoons and spears (value).	Dredges, tongs, and rakes (value).			
	No.	Value.		No.	Value.					
Maine	107	$337	$110,051	127,966	$115,717	$887	$3,237	$743,808	$671,300	$2,889,893
New Hampshire	.....	.....	13,171	2,240	2,800	90	.....	32,100	11,000	112,660
Massachusetts	545	1,134	565,516	28,494	40,297	1,379	9,555	3,058,207	4,284,200	13,245,229
Rhode Island	.....	.....	2,625	5,205	6,503	450	3,779	369,759	244,524	1,020,178
Connecticut	.....	.....	1,275	11,553	24,959	469	29,675	1,647,105	312,200	2,826,834
Total	652	1,471	692,638	175,458	190,276	3,275	46,246	5,850,979	5,523,224	20,094,794

3.—Table showing by species the yield of the fisheries of the New England States in 1889.

Species.	Maine.		New Hampshire.		Massachusetts.		Rhode Island.		Connecticut.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Albacore, fresh					74,700	$291				
Alewives, fresh	2,388,225	$13,153	140,400	$3,080	2,032,691	29,173	499,450	$7,518	53,272	$670
Alewives, salted	612,180	8,659			1,251,950	22,282	412,000	8,240		
Alewives, smoked	357,714	8,596					134,800	2,380		
Bluefish, fresh					396,967	33,786	406,875	26,998	516,956	27,383
Bluefish, salted							1,800	90		
Bonito, fresh					194,066	8,157				
Bonito, salted					1,400	88				
Bream, fresh	26,000	270								
Butter-fish, fresh	27,000	445			762,438	23,108	267,050	9,827	42,400	1,064
Catfish, fresh	6,000	120								
Cod, fresh	6,052,472	122,805	1,178,655	23,222	21,105,713	507,866	301,940	9,028	1,529,863	50,018
Cod, salted	11,482,238	314,391	195,000	5,325	55,236,288	1,505,032	63,476	2,070		
Cunners or perch, fresh	104,100	2,623	4,000	200	428,095	18,788	16,000	640	5,000	200
Cusk, fresh	367,600	4,641	33,500	350	431,778	4,932				
Cusk, salted	153,529	1,555			399,405	6,853				
Eels, fresh	103,145	8,735	12,000	1,200	424,708	24,295	249,450	11,878	315,150	24,930
Flatfish and flounders, fresh	829,475	15,815			957,773	20,966	529,750	12,425	633,980	13,005
Frostfish or tomcod, fresh	348,550	3,236			4,873	113			123,500	4,875
Grouper, fresh					16,868	269				
Haddock, fresh	4,768,709	82,371	1,470,025	25,071	34,608,037	592,173	103,120	2,332	205,590	5,599
Haddock, salted	1,520,126	20,269	90,000	1,112	697,380	9,593	10,640	212		
Hake, fresh	2,916,138	27,255	227,295	2,353	5,498,306	55,690			900	15
Hake, salted	5,208,471	61,916	110,000	1,400	855,198	12,242				
Halibut, fresh	499,363	35,955	87,600	6,132	8,913,460	611,654			264,890	20,293
Halibut, salted	600	36			974,930	48,932				
Herring, fresh	17,969,231	76,259	19,800	195	7,920,478	66,222				
Herring, salted	5,209,925	63,673			2,010,900	24,540				
Herring, smoked	3,185,925	99,639								
Hickory shad, fresh					8,640	219				
Kingfish, fresh					4,241	353	9,700	291		
Mackerel, fresh	417,441	36,074	21,860	2,010	2,305,028	190,074	296,612	25,081	33,500	3,311
Mackerel, salted	562,100	51,904	24,600	2,359	4,382,107	394,517	302,000	24,555	16,100	1,539
Menhaden, fresh	10,184,760	28,284	501,000	2,325	2,203,936	12,656	112,580,000	281,450	47,991,714	100,569
Menhaden, salted					170,800	2,944				
Pollock, fresh	2,338,516	22,575	7,000	70	3,092,438	31,901			17,400	365
Pollock, salted	958,722	9,804			1,976,801	23,557	51,520	1,840		
Red snapper, fresh	285,000	7,100			211,156	6,057			520,000	16,800
Salmon, fresh	152,740	34,118			139	66			280	222
Scup, fresh					2,501,165	82,653	6,063,800	91,921	6,800	170
Sea bass, fresh			500	40	814,084	56,795	493,150	13,823	250,201	16,641
Shad, fresh	887,800	18,687	88	3	110,724	3,962	16,650	1,149	195,852	16,580
Shad, salted					123,600	3,406				
Smelt, fresh	1,055,385	74,977	46,000	3,600	10,700	1,098	84,500	4,195	12,800	1,042
Spanish mackerel, fresh					23,461	2,473				
Squeteague, fresh					216,571	10,929	406,214	16,844	206,645	8,298
Striped bass, fresh					24,878	2,669	80,340	7,291	38,770	3,430
Sturgeon, fresh					2,800	132				
Swordfish, fresh	634,435	26,817	25,100	1,159	247,824	11,050	165,990	7,417	146,190	8,285
Swordfish, salted			3,600	180	7,200	334				
Tautog, fresh					646,365	24,365	187,625	7,700	238,640	11,352
Whiting, fresh					114,449	1,399			11,640	174
Miscellaneous fish, fresh			10,000	300	6,567	154	46,250	925	306,860	1,859
Miscellaneous fish, salted					54,200	696				
Refuse fish	448,400	1,755			1,024,400	1,093	1,106,200	1,770		
Shrimp					2,365	860				
Lobsters	25,001,351	574,165	137,175	6,415	3,353,787	148,492	456,000	21,565	1,501,290	83,099
Crabs							4,460	1,125	8,300	300
Terrapin									3,057	1,280
Squid					567,800	4,466				
Oysters					258,867	65,538	1,424,213	271,939	10,401,027	1,055,807
Clams (soft), fresh	2,242,092	73,941	3,000	150	2,243,310	123,947	333,750	32,475	263,600	24,900
Clams (soft), salted	6,181,600	126,820			274,920	13,764				
Quahogs	800	100			135,304	12,549	237,200	25,600	170,896	21,114
Scallops	295,299	18,647			117,232	26,774	22,950	2,550	2,700	230
Oyster shells									7,800,000	6,500
Algæ	12,900,000	6,315			117,993,900	66,034			18,660,000	4,903
Seal and other skins										8,610
Halibut fins					62,000	2,754				
Sounds	103,123	2,579			43,933	1,316				
Tongues	161,564	3,231			251,383	5,026				
Oil, fish	612,020	20,896	6,370	260	2,160,309	77,768				
Oil, whale					6,171,518	488,524			176,701	12,074
Ambergris					37	7,750				
Whalebone					98,268	320,115				
Total	129,559,864	2,111,206	4,354,568	88,511	299,217,669	5,858,274	127,365,475	935,144	92,672,464	1,557,506

3.—Table showing by species the yield of the fisheries of the New England States in 1889—Continued.

SUMMARY.

Species.	Pounds.	Value.	Species.	Pounds.	Value.
Albacore, fresh	74,700	$291	Scup, fresh	8,571,765	$174,744
Alewives, fresh	5,114,038	53,594	Sea bass, fresh	1,557,935	87,299
Alewives, salted	2,276,130	39,181	Shad, fresh	1,211,114	40,381
Alewives, smoked	492,514	10,976	Shad, salted	123,600	3,406
Bluefish, fresh	1,320,798	88,167	Smelt, fresh	1,209,385	84,912
Bluefish, salted	1,800	90	Spanish mackerel, fresh	23,461	2,473
Bonito, fresh	194,066	8,157	Squeteague, fresh	829,430	36,071
Bonito, salted	1,400	88	Striped bass, fresh	143,988	13,390
Bream, fresh	26,000	270	Sturgeon, fresh	2,800	132
Butter-fish, fresh	1,098,888	34,444	Swordfish, fresh	1,219,539	54,728
Catfish, fresh	6,000	120	Swordfish, salted	10,800	514
Cod, fresh	30,168,643	712,939	Tautog, fresh	1,072,630	43,417
Cod, salted	66,977,002	1,826,818	Whiting, fresh	126,089	1,573
Cunners or perch, fresh	557,195	22,451	Miscellaneous fish, fresh	369,677	3,238
Cusk, fresh	832,878	9,923	Miscellaneous fish, salted	54,200	696
Cusk, salted	552,934	8,408	Refuse fish	2,579,000	4,618
Eels, fresh	1,104,453	71,038	Shrimp	2,365	860
Flatfish and flounders, fresh	2,950,978	62,211	Lobsters	30,449,603	893,736
Frostfish or tomcod, fresh	476,923	8,224	Crabs	12,760	1,425
Grouper, fresh	16,868	269	Terrapin	3,057	1,280
Haddock, fresh	41,155,481	707,546	Squid	567,800	4,466
Haddock, salted	2,318,146	31,186	Oysters	12,084,107	1,393,284
Hake, fresh	8,642,639	85,313	Clams (soft), fresh	5,085,752	255,413
Hake, salted	6,173,669	75,558	Clams (soft), salted	6,456,520	140,584
Halibut, fresh	9,765,313	674,034	Quahogs	544,200	59,363
Halibut, salted	975,530	48,968	Scallops	438,181	48,201
Herring, fresh	25,909,509	142,676	Oyster shells	7,800,000	6 500
Herring, salted	7,220,825	88,213	Algæ	149,553,900	77,252
Herring, smoked	3,185,925	99,639	Seal and other skins	.....	8,610
Hickory shad, fresh	8,640	219	Halibut fins	62,000	2,754
Kingfish, fresh	13,941	644	Sounds	147,056	3,895
Mackerel, fresh	3,074,441	256,550	Tongues	412,947	8,257
Mackerel, salted	5,286,967	474,874	Oil, fish	2,778,699	98,924
Menhaden, fresh	173,461,410	425,284	Oil, whale	6,348,219	500,598
Menhaden, salted	170,800	2,944	Ambergris	37	7,750
Pollock, fresh	5,455,354	54,911	Whalebone	98,268	320,115
Pollock, salted	2,987,043	35,201			
Red snapper, fresh	1,016,156	29,957	Total	653,170,040	10,550,641
Salmon, fresh	153,159	34,406			

The question of the nationality of the persons constituting the crews of American fishing vessels is one of marked consequence, in view of the dependence to be placed on the fishery marine of New England in the event of war. The following table gives an accurate idea of the extent to which the citizens of foreign countries were represented in the vessel fisheries of the New England States in 1889. The figures show that Americans constitute 78.30 per cent of the fishermen, while British provincials compose 9.52 per cent and all other nationalities 12.18 per cent.

4.—Table showing the number and nationality of persons employed in the vessel fisheries of the New England States in 1889.

States.	Americans.	British provincials.	All others.	Total.
Maine	2,413	246	21	2,680
New Hampshire	124	11	6	141
Massachusetts	8,002	1,157	1,692	10,851
Rhode Island	386	.....	2	388
Connecticut	916	26	120	1,062
Total	11,841	1,440	1,841	15,122

Fishing Vessels.—Nothing connected with the development of the New England fisheries is more worthy of notice than the improvements recently made in the form and rig of sea-going fishing vessels. The change has been most noticeable, perhaps, in Massachusetts. A few years ago the New England fleet was composed of wide, sharp, shallow schooners, remarkable for having very broad sterns and flat counters. As a

rule they were heavily rigged, and were extremely unsafe in the severe gales to which they were frequently exposed. Many foundered at sea, going down with all their crews, and the loss of life and property was often appalling. The very general belief that this type of vessel was the best for speed led to its general adoption, speed being an important factor in nearly all of the ocean fisheries.

As early, however, as 1882 the U. S. Fish Commission called attention to the faults of this form and rig of fishing vessels, and a change was vigorously urged through the publication of letters in the newspapers printed in fishing towns. Later, in 1886, the Fish Commission schooner *Grampus* was built on new lines. She was a marked innovation on the prevailing ideas concerning the building of fishing vessels, being deeper, and also less broad and flat in her after section. It is to the credit of those interested to say that they soon saw the advantage of having safer and swifter vessels, and since the date last mentioned the most radical changes have occurred in form and rig. The very best talent has been brought to the work of designing fishing craft, and it is safe to assume that at present no other country has a fleet of sailing fishing vessels so swift or so beautiful as those recently turned out from the shipyards of New England, while their seaworthiness has been correspondingly improved. Already the old type is rapidly being superseded by the new, and the change will probably be quite complete in a few years in those branches of fishery where speed and seaworthiness are specially important factors. As a result, not only will there be a marked reduction in loss of life and property by vessels foundering at sea, but the fisheries will be vastly benefited by having vessels so much swifter than those formerly employed.

Mention may appropriately be made of the introduction of the cutter rig on small craft. Until recently the schooner rig has been practically universal north of Cape Cod, but within the past three or four years a few vessels of about 15 or 18 tons have been rigged as cutters or sloops with what is commonly called a double-head rig. These craft have been built on fine lines, and have in some cases been so swift that yachts have been copied after them.

The number and tonnage of the vessels of different rigs employed in the fisheries of each New England State are shown in the next table, the vessels fishing and those transporting being given separately. The special facts disclosed by the table are: (1) the great preponderance of the schooner in the New England States as a whole, and especially in Maine, Massachusetts, and New Hampshire; (2) the employment of ships, barks, and brigs only in the fisheries of Massachusetts; (3) the relatively large number of steam vessels in Connecticut and Rhode Island, and (4) the restriction of the cat rig to Massachusetts and Rhode Island. The proportion of each rig is as follows: Schooners, 78.21 per cent; sloops, 11.09 per cent; steamers, 5.71 per cent; barks, 2.46 per cent; cats, 1.95 per cent; ships, 0.32 per cent, and brigs, 0.26 per cent. The square-rigged vessels are all employed in the whale fishery, the steamers chiefly in the menhaden and oyster industries; sloops have always been in more general favor in Connecticut than elsewhere; the cat-rigged vessels are small, generally only a little more than 6 tons each, and what are commonly called boats. The almost universal adoption of the schooner rig for fishing purposes is well known and emphasizes its fitness for American waters.

5.—Table showing by States and rigs the number and tonnage of vessels employed in the fisheries of the New England States in 1889.

States.	Rigs.	Fishing vessels.		Transporting vessels.	
		No.	Tonnage.	No.	Tonnage.
Maine	Steamers	1	19.28	5	46.73
	Schooners	336	11,351.02	50	1,556.13
	Sloops	12	106.14	4	57.37
	Total	349	11,476.44	59	1,660.23
New Hampshire	Steamers	1	89.63	.....	.....
	Schooners	13	489.42	.....	.....
	Sloops	1	9.00	.....	.....
	Total	15	588.05	.....	.....
Massachusetts	Steamers	4	974.19	.....	.....
	Ships	5	1,753.87	.....	.....
	Barks	38	9,538.77	.....	.....
	Brigs	4	465.60	.....	.....
	Schooners	702	44,715.90	18	1,242.09
	Sloops	40	402.82	3	26.84
	Cats	21	133.03	1	6.19
	Total	814	57,984.18	22	1,275.12
Rhode Island	Steamers	16	751.15	.....	.....
	Schooners	26	474.30	1	21.07
	Sloops	17	158.72	1	7.81
	Cats	3	17.88	5	53.86
	Total	62	1,402.05	7	82.74
Connecticut	Steamers	61	2,183.39	.....	.....
	Schooners	55	1,898.13	5	118.77
	Sloops	84	971.08	9	98.31
	Total	200	5,052.60	14	217.08
New England States	Steamers	83	4,017.64	5	46.73
	Ships	5	1,753.87	.....	.....
	Barks	38	9,538.77	.....	.....
	Brigs	4	465.60	.....	.....
	Schooners	1,132	58,928.77	74	2,938.06
	Sloops	154	1,647.76	17	190.33
	Cats	24	150.91	6	60.05
	Grand total	1,440	76,503.32	102	3,235.17

A further classification of the products of the fisheries is given in the following tabulation. The various fisheries for food-fish are seen to have yielded $6,570,610, the fisheries for oysters, clams, and other mollusks, $1,907,811; the fisheries for lobsters, crabs, and other crustaceans, $837,301; the fishery for menhaden, $395,167; and the fisheries for whales and seals, $837,073.

6.—Table showing the values of the various coast fisheries of the New England States in 1889.

States.	General fisheries.	Oyster and other molluscan fisheries.	Crustacean and reptilian fisheries.	Menhaden fishery.	Mammalian fisheries.	Total.
Maine	$1,298,728	$219,508	$574,165	$18,805	.....	$2,111,206
New Hampshire	79,846	150	6,415	2,100	.....	88,511
Massachusetts	4,639,495	247,038	149,352	6,000	$816,389	5,858,274
Rhode Island	298,440	332,564	22,690	281,450	.....	935,144
Connecticut	256,780	1,108,551	84,679	86,812	20,684	1,557,506
Total	6,573,289	1,907,811	837,301	395,167	837,073	10,550,641

A most important and interesting presentation is made in Table 7, which exhibits by States the quantities and values of fishery products taken by the principal forms of apparatus. Weirs, pound nets, and trap nets take the largest quantities of fish in Maine, but yield the most remunerative returns in Massachusetts, a circumstance due to the difference in the character of the fish in the two States. The catch in seines is greatest in Rhode Island, after which come Connecticut and Maine, but the value of seine-caught fish is much the greatest in Massachusetts. Gill nets take the most fish in Maine, but give the largest money returns in Massachusetts. In Connecticut both the catch and the value of products taken in fyke nets are greater than in any other State. Pots give larger results in Maine than in all the other States combined. Massachusetts easily leads in the products of the hand-line and trawl-line fisheries, showing an excess of nearly $2,500,000 over the aggregate results in all other New England States. The use of miscellaneous apparatus, such as guns, harpoons, dredges, tongs, rakes, dip nets, etc., yields the best results in Massachusetts, though Connecticut is only slightly behind. The catch of whales with harpoons is not considered, this being the reason for the apparent high rank of Connecticut.

Considering the total output for each form of apparatus, it is found that, although the most primitive means of capture, lines took 27.70 per cent of the products and 43.52 per cent of the value; while seines, which yielded nearly as large a percentage of products, viz, 26.73 per cent, took only 8.85 per cent of the value of products. This disparity in value is due to the fact that the most valuable food species are taken on lines, whereas the fish caught in seines are chiefly menhaden, which are sold at relatively low prices for manufacture into oil and fertilizer.

The development of the pound-net, weir, and trap fishery has been quite remarkable in certain sections of New England since the abrogation of the fishery clauses of the Washington treaty. This has been, in a measure, due to the demand for bait caught on our own shores, and has led to the profitable prosecution of the pound-net fishery on the coasts of Maine, Massachusetts, and Rhode Island, in particular. Barnstable Bay and the region east of Portland, Maine, have become noted bait resorts during a large part of each year when herring, squid, and other bait species approach the coast. As will be seen by the tables exhibiting this branch of fishery, the increase in the number of these forms of apparatus has been very marked since 1880.

A remarkable outcome of the pound-net fishery is the profitable utilization of certain products for food purposes that heretofore have been accounted worthless or of little value. Among these may be mentioned the squid, the horse-mackerel or tunny, and the whiting or "Old England hake." It is only recently that the first two species have been considered of any value for food in our markets. The squid is now quite highly prized, and at times the demand is greater than the supply in the markets of the large cities.

The horse mackerel constitutes a cheap, wholesome, and palatable food, and its capture and utilization for this purpose are additionally important in view of the fact that it is one of the most predaceous species in American waters; and, being of large size and generally numerous, it is exceedingly destructive to those species upon which it preys, such as the mackerel, herring, menhaden, etc.

Although the whiting, as it comes from the water, is one of the best-flavored and most nutritious of our food-fishes, the difficulty of keeping it fresh and in good condition when iced has militated against its utilization to a large extent for market

purposes. Often great quantities are taken in pound nets and floating traps; but generally these fish have to be turned out of the nets, only to reënter perhaps on the next tide. Some effort has been made to market at least a portion of the catch, and it is to be hoped that a method will be discovered for utilizing quantities of this species. In view of its abundance and cheapness it seems pertinent to suggest the possibility of its profitable utilization by canning or smoking. Its delicate flavor should make it an excellent article of food when canned, or, if lightly salted and prepared like kippered herring and finnan haddies, a demand might be created which would consume great quantities of what is now essentially a waste product.

Another noteworthy result of the abolition of the fishery clauses of the Washington treaty and the attempt of American fishermen to secure supplies of bait on the New England coast, is the catch of herring at night on the coast of Maine by means of the purse seine; for a number of years it has been a common occurrence to catch mackerel at night in this manner, and on some occasions herring have been thus taken by mistaking them for mackerel. The recent demand for bait led to the attempt being made at and near Boothbay to carry on somewhat of a systematic purse-seine fishery for herring at night. The results have been gratifying, on the whole, and there is fair promise of the continuance of the enterprise.

Mention may be made here of the fact that at certain seasons, especially in spring and summer, the herring occurring offshore in the Gulf of Maine are in prime condition for pickling. If these are taken and properly prepared, they will readily sell at a high price.

7.—*Table showing the quantities, values, and percentages of fishery products taken in each kind of apparatus in the New England States in 1889.*

Apparatus.	Maine.		New Hampshire.		Massachusetts.		Rhode Island.		Connecticut.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Weirs, pound nets and trap nets	21,921,538	$231,326	138,788	$3,303	14,633,315	$328,386	9,683,879	$171,771	7,556,665	$43,288
Seines	*12,411,693	*132,800	503,800	5,289	7,099,120	405,935	113,162,525	297,115	41,426,634	92,717
Gill nets	9,608,708	120,802	61,960	940	5,163,153	139,278	292,820	18,924	116,880	6,714
Fyke nets	111,000	1,380	.....	.....	44,655	1,400	114,250	3,045	455,250	8,759
Pots	25,083,426	581,416	137,175	6,415	3,657,251	163,956	570,750	27,405	1,834,740	108,432
Trawl and hand lines	37,055,071	758,198	3,462,775	69,615	135,387,320	3,533,965	1,352,688	75,778	3,049,824	153,593
Miscellaneous	23,368,428	285,194	50,070	2,949	133,232,805	1,285,354	2,188,563	341,106	37,632,471	1,144,003
Total	129,559,864	2,111,206	4,354,568	88,511	299,217,669	5,858,274	127,365,475	935,144	92,672,464	1,557,506

Apparatus.	Total.		Percentage.	
	Pounds.	Value.	Pounds.	Value.
Weirs, pound nets, and trap nets	53,934,185	$778,074	8.26	7.37
Seines	174,603,772	933,946	26.73	8.85
Gill nets	15,243,521	286,608	2.33	2.72
Fyke nets	725,155	14,584	.11	.14
Pots	31,283,342	887,024	4.79	8.41
Trawl and hand lines	180,907,678	4,591,149	27.70	43.52
Miscellaneous	196,472,387	3,058,606	30.08	28.99
Total	653,170,040	10,550,641	100.00	100.00

*Including bag nets.

The following table, showing the actual and relative importance of the vessel and shore fisheries, presents some interesting facts. In Maine the vessel fishery employed 29 per cent of the fishermen, 63 per cent of the investment in fishing property, and yielded 33 per cent of the value of products. In New Hampshire this branch of fishery furnished occupation for 42 per cent of the fishermen, 86 per cent of the fishery investments, and produced 63 per cent of the catch. Seventy-four per cent of the fishermen of Massachusetts were employed on vessels; 90 per cent of the value of fishing property was invested in vessels, which landed 82 per cent of the fishery products. Rhode Island had 30 per cent of her fishermen and 59 per cent of her fishing investments in the vessel fishery, which yielded 43 per cent of the products. The returns for Connecticut show that this branch of fishery employed 45 per cent of the fishermen, 80 per cent of the invested capital, and produced 71 per cent of the value of the catch. Massachusetts had the greatest percentage of fishermen in vessel fisheries, and Maine the greatest percentage in shore fisheries; Massachusetts had the largest proportion of capital in vessels, and Rhode Island the largest ratio in shore fishery, boats, and apparatus; Massachusetts vessel fisheries and Maine shore fisheries took the greatest percentage of products. The men and vessels employed in transporting fishing products are not included in the discussion or table.

8.—Table showing by States the actual and relative importance of the vessel and shore fisheries of New England in 1889.

States.	Fishermen.				Investment.				Products.			
	No.		Percentage.		Value.		Percentage.		Value.		Percentage.	
	Vessel.	Shore.	Vessel.	Shore.	Vessel.	Shore.	Vessel.	Shore.	Vessel.	Shore.	Vessel.	Shore.
Maine	2,515	6,205	29	71	$871,115	$515,095	63	37	$690,967	$1,420,239	33	67
New Hampshire	141	194	42	58	59,764	9,796	86	14	56,018	32,493	63	37
Massachusetts	10,760	3,748	74	26	5,272,577	567,220	90	10	4,778,185	1,080,089	82	18
Rhode Island	376	896	30	70	236,435	166,445	59	41	398,310	536,834	43	57
Connecticut	1,030	1,252	45	55	681,476	170,608	80	20	1,107,087	450,419	71	29
Total	14,822	12,295	55	45	7,121,367	1,429,164	83	17	7,030,567	3,520,074	67	33

Table 9, which is next presented, shows by fisheries the extent and relative value of the vessel fisheries in each of the New England States. With a view to exhibit the full comparative importance of the various fisheries, each vessel is credited to all the fisheries in which it was engaged during any portion of the year, together with its tonnage, value, and crew. It is therefore duplicated to that extent. The value of the catch in each fishery, however, is not duplicated, and taken in the aggregate will give the total value of the vessel fisheries of each State, with the exception of sounds, tongues, and fish oil.

9.—Table showing the relative importance of each of the vessel fisheries of the New England States in 1889.

Fisheries.	States.	No. of vessels.	Net tonnage.	Value of vessels.	No. of men.	Value of catch.
Bank cod	Maine	48	4,257.12	$214,900	773	$190,423
	Massachusetts	306	23,702.69	1,261,026	4,295	1,532,767
	Total	354	27,959.81	1,475,926	5,068	1,723,190
Halibut	Maine	4	334.09	21,500	52	15,992
	New Hampshire	1	68.93	2,800	12	6,132
	Massachusetts	53	4,466.84	286,834	804	536.176
	Total	58	4,869.86	311,134	868	558,300
Mackerel	Maine	80	7,096.01	311,490	584	66,376
	New Hampshire	7	243.96	14,600	65	4,129
	Massachusetts	297	13,318.82	700,780	2,976	473,755
	Rhode Island	26	291.63	22,325	97	18,136
	Connecticut	9	160.40	11,650	27	3,894
	Total	419	21,110.82	1,060,845	3,749	566,290
Market	Maine	18	1,210.62	64,900	244	66,594
	New Hampshire	1	68.93	2,800	12	1,800
	Massachusetts	201	13,440.18	827,175	2,887	1,119,699
	Connecticut	27	1,022,44	62,600	197	104,072
	Total	247	15,742.17	957,475	3,340	1,292,165
Shore	Maine	217	4,755.82	185,090	1,225	228,386
	New Hampshire	11	337.06	16,400	96	39,613
	Massachusetts	180	3,407.53	172,775	999	177,188
	Rhode Island	21	249.81	21,200	84	10,967
	Connecticut	37	481.84	31,330	111	26,360
	Total	466	9,232.06	426,795	2,515	482,514
Whale and seal	Massachusetts	68	14,303.55	663,400	1,918	816,389
	Connecticut	4	402.33	15,000	69	20,684
	Total	72	14,705.88	678,400	1,987	837,073
Herring	Maine	107	1,908.01	69,000	455	39,507
	Massachusetts	34	742.07	35,550	174	15,060
	Total	141	2,650.08	104,550	629	54,567
Menhaden	Maine	20	641.52	23,110	163	18,805
	New Hampshire	1	89.63	6,000	16	2,100
	Massachusetts	1	26.97	6,000	13	6,000
	Rhode Island	16	890.05	137,000	219	281,450
	Connecticut	6	451.80	61,500	125	86,812
	Total	44	2,099.97	233,610	536	395,167
Swordfish	Maine	25	700.51	34,050	157	26,817
	New Hampshire	1	30.93	1,600	9	1,339
	Massachusetts	30	440.53	28,050	139	9,636
	Rhode Island	16	232.43	24,525	64	7,417
	Connecticut	11	186.86	13,150	39	8,101
	Total	83	1,591.26	101,375	408	53,310
Molluscan	Maine	7	97.08	2,875	30	3,532
	Massachusetts	12	75.25	4,975	25	3,569
	Rhode Island	17	180.17	26,350	44	79,745
	Connecticut	113	2,326.89	319,150	419	831,100
	Total	149	2,679.39	353,350	518	917,946
Lobster	Maine	29	370.64	14,825	102	17,432
	New Hampshire	1	19.41	1,300	6	645
	Massachusetts	10	151.75	9,000	35	3,836
	Rhode Island	1	5.45	500	2	595
	Connecticut	22	261.18	18,915	62	26,064
	Total	63	808.43	44,540	207	48,572

Two tables are next introduced which give for the vessel and shore fisheries, respectively, certain averages and percentages which are instructive. They show the great differences between the various States in certain elements of these industries.

In the size of vessels, it is seen that the average is 32.88 tons in Maine, 39.20 tons in New Hampshire, 71.23 tons in Massachusetts, 22.61 tons in Rhode Island, and 25.34 tons in Connecticut. The general average is 53.18 tons. The average value of vessels is least in Maine, viz, $1,500, and greatest in Massachusetts, viz, $3,738, the average for New England being $2,993. The average value per net ton is also least in Maine and greatest in Rhode Island, the latter State having a considerable fleet of expensive steam vessels. Massachusetts vessels have a less value per ton than those of Connecticut and New Hampshire, Connecticut having a number of steamers which bring up the average and New Hampshire possessing a small fleet of relatively valuable vessels. The general average value per ton is $57. In the items of apparatus and outfit, Massachusetts also takes the lead, with an average of $2,739, followed by New Hampshire, Maine, Connecticut, and Rhode Island, the last State being credited with $679, while the average for all the States is $1,958. The average number of men carried on vessels is 13 in Massachusetts, 9 in New Hampshire, 7 in Maine, 6 in Rhode Island, and 5 in Connecticut, the general average being 10. Connecticut and Rhode Island easily take the first positions in the average value of catch for each man constituting the crews, owing to the use of steam in the oyster and menhaden fisheries; Massachusetts ranks third, followed by New Hampshire and Maine. Rhode Island takes precedence in the matter of average gross stock per vessel, with $6,424, after which are Massachusetts with $5,867, Connecticut with $5,591, New Hampshire with $3,734, and Maine with $1,979, the average for all States being $4,888. For each net ton the vessels of Rhode Island and Connecticut take products to the value of $284 and $221, respectively, while the average for all the other States is less than $100. For each $100 invested in the vessel fishery, Rhode Island and Connecticut vessels stock $168 and $163, respectively, taking similar precedence over the remaining States.

Consideration of the figures showing the percentages of value of products for each form of apparatus employed in the vessel fisheries discloses some important facts illustrative of the different interests involved in the fisheries of the several States. The seine is more important than any other apparatus in Rhode Island, in which State 71 per cent of the stock of the vessels is obtained by this means, while in each of the other States the seine is to be credited with only 10 per cent or less of the value of products. In New Hampshire, Maine, and Massachusetts hand lines and trawl lines yield the largest returns, the figures for these States being 86 per cent, 73 per cent, and 72 per cent, respectively. In Connecticut only 12 per cent of the value of products is obtained with lines, and in Rhode Island only 7 per cent. Gill nets and pots are of greater comparative value in the vessel fisheries of Maine than elsewhere, although their general importance is slight. Miscellaneous forms of apparatus, as fyke nets, dredges, rakes, harpoons, guns, etc., are much more valuable in Connecticut than elsewhere, as much as 78 per cent of the value of the vessel catch in that State being taken in this way. Concerning New England as a whole, it is seen that 59 per cent of the yield of the vessel fisheries is taken with lines, 12 per cent with seines, 1 per cent each with gill nets and pots, and 27 per cent with miscellaneous devices.

In the shore fisheries the average value of fishery products taken by each man is greatest in Rhode Island and least in New Hampshire, the general average being $286, a sum considerably less than in the vessel fisheries. For each $100 invested in boats, $536 worth of products are obtained, Rhode Island, New Hampshire, and Maine having more than the general average, and Massachusetts and Connecticut less. The

average value of catch for each $100 devoted to apparatus is greatest in Connecticut and least in Massachusetts, the average for the region being $456.

In the shore fisheries of Maine, pots yield 40 per cent of the gross income and are by far the most important form of apparatus; in New Hampshire they are credited with 18 per cent of the value of fishery products, in Massachusetts 15 per cent, in Connecticut 16 per cent, and in Rhode Island 5 per cent, the average for New England being 24 per cent. Pound nets, trap nets, and weirs are relatively more important in Rhode Island than in any other State, 32 per cent of the value of shore fisheries resulting from their use; Massachusetts closely follows with 30 per cent, while Maine, New Hampshire, and Connecticut have 16, 10, and 10 per cent, respectively, the total for the region being less than for pots, or 22 per cent. The comparative value of lines is by far the greatest in New Hampshire, viz, 66 per cent, after which come Maine with 18 per cent, Massachusetts with 10 per cent, Rhode Island with 9 per cent, and Connecticut with 5 per cent. The difference between the shore and vessel fisheries in this respect is very noticeable. Gill nets, of little relative importance in any State, are most valuable in Massachusetts. Seines and bag nets are chiefly valuable in Maine and are generally less important than gill nets. The miscellaneous apparatus already specified yields 67 per cent of the income of fishermen in Connecticut, 48 per cent in Rhode Island, and 34 per cent in Massachusetts, the general average of 33 per cent being much greater than for any other single form of apparatus separately referred to.

10.—Table showing certain averages and percentages for the vessels employed in the fisheries of the New England States in 1889.

States.	Average tonnage of vessels.	Average value of vessels.	Average value per net ton.	Average value of apparatus and outfit.	Average number of crew.	Average value of catch per man.	Average value of catch per vessel.	Average value of catch per ton.	Average value of catch per each $100 invested in vessels, outfit, and apparatus.	Percentage of value of catch in each form of apparatus.				
										Lines.	Seines.	Gill nets.	Pots.	Miscellaneous apparatus.
Maine	32.88	$1,500	$46	$995	7	$275	$1,979	$60	$71	72.83	9.81	7.88	2.61	6.87
New Hampshire	39.20	2,133	54	1,831	9	397	3,734	95	94	86.27	9.23	.50	1.15	2.85
Massachusetts	71.23	3,738	53	2,739	13	444	5,867	82	91	71.67	8.15	.90	.08	19.20
Rhode Island	22.61	3,118	138	679	6	1,059	6,424	284	168	7.29	70.66	.02	.15	21.88
Connecticut	25.34	2,582	102	853	5	1,114	5,591	221	163	12.01	7.95	.....	2.35	77.69
Total	53.18	2,993	57	1,958	10	475	4,888	92	99	58.86	11.83	1.39	.70	27.22

11.—Table showing certain averages and percentages for the shore fisheries of the New England States in 1889.

States.	Average value of catch per man.	Average value of catch per each $100 invested in boats.	Average value of catch per each $100 invested in apparatus.	Percentage of value of catch in each form of apparatus.					
				Pound nets, trap nets, and weirs.	Pots.	Lines.	Gill nets.	Haul seines and bag nets.	Miscellaneous apparatus.
Maine	$229	$598	$508	16.40	39.94	18.07	4.70	4.62	16.27
New Hampshire	167	774	580	10.17	17.75	65.52	2.03	.37	4.16
Massachusetts	288	425	345	30.40	14.83	10.11	8.89	1.55	34.22
Rhode Island	599	856	517	32.00	4.99	8.71	3.51	2.92	47.87
Connecticut	359	457	626	9.61	15.86	4.59	1.49	1.04	67.41
Total	286	536	456	22.15	23.58	12.90	5.37	2.92	33.08

Table 12 gives by States the relative value of fifteen important edible fishery products. Maine surpasses the other States in the value of hake, herring, smelt, swordfish, clams, and lobsters, and Massachusetts leads in the value of alewives, bluefish, cod, haddock, halibut, mackerel, and pollock. Rhode Island ranks first in the item of menhaden and Connecticut in oysters.

12.—Table showing for each of fifteen important species the percentage of value in each New England State to the total value of the catch in New England.

Species.	Maine.	New Hampshire.	Massachusetts.	Rhode Island.	Connecticut.
Alewives	29.31	2.97	49.59	17.48	.65
Bluefish	.....	.....	38.28	30.69	31.03
Cod	17.21	1.12	79.26	.44	1.97
Haddock	13.89	3.55	81.46	.34	.76
Hake	55.43	2.33	42.23	.....	.01
Halibut	4.98	.85	91.37	.....	2.80
Herring	72.48	.06	27.46	.....	.....
Mackerel	12.03	.60	79.92	6.79	.66
Menhaden	6.61	.54	3.64	65.72	23.49
Pollock	35.93	.08	61 54	2.04	.41
Smelt	88.30	4.24	1.29	4.94	1.23
Swordfish	48.54	2.42	20.61	13.43	15.00
Clams	50.70	.04	34.77	8.20	6.29
Oysters	.....	.....	4.70	19.52	75.78
Lobsters	68.86	.77	*17.81	2.59	9.97

The relative extent of the fisheries of New England in 1880 and 1889 is brought out in Tables 13, 14, and 15. The figures given for 1880 are those obtained for the census and represent, for the most part, the statistical condition of the fisheries in 1879. These tables, therefore, indicate the changes during the past decade.

It is seen that there has been a net decrease in the number of fishermen amounting to 2,421, and a net increase in the number of shoresmen aggregating 1,914, leaving a total net decrease in persons employed of 507. Maine is the only State in which there has been a general increase in the persons engaged in the fisheries, although Connecticut shows a substantial gain in the number of shoresmen. In the former State the percentage of increase was 27.62, while in New Hampshire, Massachusetts, Rhode Island, and Connecticut the percentage of decrease was 11.83, 14.31, 23.94, and 2.68, respectively, the net decrease being 1.37 per cent.

In the items constituting investment there have been numerous changes during the decade. The vessels employed in the fisheries have been reduced in number by 445, with a tonnage of 30,609.43, and a value of $75,471, exclusive of outfit and apparatus; this decrease is observed in every State, although Maine, Rhode Island, and Connecticut exhibit an increased investment in vessels, indicating the employment of more fishing craft of superior types, notably steamers, in the two latter States. The decrease in Massachusetts is chiefly in whalers. In the number of boats there has been a net decline of 3,226, valued at $82,960, although both Maine and Connecticut show a small increase in number. The amount of investment in apparatus and outfit has naturally decreased with the decline in the number of fishermen, vessels, and boats. The year 1880 presents an excess over 1889 amounting to $1,426,600; Rhode Island alone has advanced in this respect. Shore property and cash capital show a net increase of $1,776,868, participated in by Massachusetts, Rhode Island, and Connecticut, the last State showing the greatest advance. In the total investment in fishing property and appliances, there has been a net increase of $191,837, or 0.96 per cent, Rhode Island and Connecticut alone sharing in this advance.

The most interesting comparison is that which relates to the results of the fisheries. It is found that the general food-fish fisheries have experienced a serious decline in the three most northern States of the section, and that in the two southern States there has been a satisfactory improvement, the net decrease being $1,843,517; this decrease may be accounted for by the scarcity of mackerel. A return of this species in its former abundance would place additional products on the market having a value much greater than the difference noted. The fisheries for clams, oysters, scallops, and other mollusks have advanced in every State except New Hampshire, and exhibit a total net excess over 1880 of $944,752. The value of lobsters and other crustaceans was $312,346 greater in 1889 than in 1880, the principal part of this sum representing the lobster fishery of Maine. The menhaden fishery in New England has increased $30,202 since 1880, notwithstanding the fact that much of the capital formerly devoted to the industry in Massachusetts and Connecticut has been diverted into other channels. In Rhode Island, which is the most important center of the menhaden fishery, the increase in the value of fish caught has been $109,715. As is well known, the whale and seal fisheries are much less extensively prosecuted than in 1880, and the large decrease of $1,396,163 is not surprising. Considering the aggregate results of the fisheries, the table shows that the net decrease in the value of products was $1,952,380, or 15.62 per cent. Connecticut has undergone the largest increase, amounting to 66.89 per cent, and New Hampshire shows the largest decrease, 48.13 per cent.

13.—Comparative table showing the number of persons employed in the fisheries of the New England States in 1880 and 1889.

State.	Fishermen.		Shoresmen.		Total.		Increase or decrease in 1889.	Percentage of increase or decrease in 1889.
	1880.	1889.	1880.	1889.	1880.	1889.		
Maine	8,110	8,885	2,961	5,244	11,071	14,129	+3,058	+27.62
New Hampshire	376	335	38	30	414	365	— 49	— 11.83
Massachusetts	17,165	14,599	2,952	2,639	20,117	17,238	—2,879	—14.31
Rhode Island	1,602	1,284	708	473	2,310	1,757	— 553	—23.94
Connecticut	2,585	2,314	546	733	3,131	3,047	— 84	— 2.68
Total	29,838	27,417	7,205	9,119	37,043	36,536	— 507	— 1.37

14.—Comparative table showing the number and value of vessels, boats, etc., employed in the fisheries of the New England States in 1880 and 1889.

States.	Vessels.						Boats.			
	1880.			1889.			1880.		1889.	
	No.	Net tonnage.	Value.	No.	Net tonnage.	Value.	No.	Value.	No.	Value.
Maine	574	16,529.66	$598,892	408	13,136.67	$599,165	5,920	$245,624	5,990	$237,469
New Hampshire	23	1,019.05	51,500	15	588.05	32,000	211	7,780	73	4,170
Massachusetts	1,007	81,080.49	3,171,189	836	59,259.30	3,098,345	6,749	351,736	3,494	254,033
Rhode Island	92	2,502.77	191,850	69	1,484.79	196,950	734	61,245	651	62,743
Connecticut	291	9,215.95	514,050	214	5,269.68	525,550	1,173	73,585	1,353	98,595
Total	1,987	110,347.92	4,527,481	1,542	79,738.49	4,452,010	14,787	739,970	11,561	657,010

14.—Comparative table showing the number and value of vessels, boats, etc., employed in the fisheries of the New England States in 1880 and 1889—Continued.

States.	Value of apparatus and outfits.		Cash capital and shore property.		Total capital invested.		Increase or decrease in 1889.	Percentage of increase or decrease in 1889.
	1880.	1889.	1880.	1889.	1880.	1889.		
Maine	$934,593	$638,151	$1,562,235	$1,415,108	$3,341,344	$2,889,893	— $451,451	—13.51
New Hampshire	60,385	33,390	89,800	43.100	209,465	112,660	— 96,805	—46.22
Massachusetts	3,528,925	2,550,444	7,282,600	7,342,407	14,334,450	13,245,229	—1,089,221	— 7.60
Rhode Island	138,733	146,202	204,850	614,283	596,678	1,020,178	+ 423,500	+70.98
Connecticut	375,535	243,384	457,850	1,959,305	1,421,020	2,826,834	+1,405,814	+98.93
Total	5,038,171	3,611,571	9,597,335	11,374,203	19,902,957	20,094,794	+ 191,837	+ .96

15.—Comparative table showing the values of the fisheries of the New England States in 1880 and 1889.

States.	General fisheries.		Molluscan fisheries.		Crustacean and reptilian fisheries.		Menhaden fishery.		Mammalian fisheries.	
	1880.	1889.	1880.	1889.	1880.	1889.	1880.	1889.	1880.	1889.
Maine	$2,313,655	$1,298,728	$112,706	$219,508	$316,210	$574,165	.....	$18,805	.....	.....
New Hampshire	154,154	79,846	8,980	150	7,500	6,415	.....	2,100	.....	.....
Massachusetts	5,547,910	4,639,495	133,784	247,038	158,229	149,352	*$30,500	6,000	$2,089,337	$816,389
Rhode Island	226,244	298,440	282,964	332,564	15,871	22,690	*171,735	281,450	.....	.....
Connecticut	174,843	256,780	424,625	1,108,551	27,145	84,679	*162,730	86,812	143,899	20,684
Total	8,416,806	6,573,289	963,059	1,907,811	524,955	837,301	364,965	395,167	2,233,236	837,073

States.	Total.		Increase or decrease in 1889.	Percentage of increase or decrease in 1889.
	1880.	1889.		
Maine	$2,742,571	$2,111,206	— $631,365	— 23.02
New Hampshire	170,634	88,511	— 82,123	— 48.13
Massachusetts	7,959,760	5,858,274	— 2,101,486	— 26.40
Rhode Island	696,814	935,144	+ 238,330	+ 34.20
Connecticut	933,242	1,557,506	+ 624,264	+ 66.89
Total	12,503,021	10,550,641	— 1,952,380	— 15.62

* Estimated.

The menhaden fishery is remarkable for the opposition which it has met with in recent years, and which has never been equaled in the case of any other ocean fishery of the United States. The effective methods for the capture of fish which have been employed in catching menhaden have led many otherwise well-informed persons, and many of the boat fishermen along the coast, whose operations are carried on upon a very limited scale, to believe that these methods are harmful and destructive, and calculated not only to materially decrease the abundance of menhaden, but also to seriously interfere with the food-fish fisheries. For this reason, a very decided and active prejudice has developed and legislation has been sought both in State legislatures and Congress to restrict the operations of menhaden fishermen with the alleged object of benefiting other fisheries. The lack of space renders it impracticable to enter into a discussion here of this matter with sufficient detail to elucidate all sides of the subject; but it seems very remarkable that an industry of such importance should not only be deprived of the encouragement generally accorded to other fisheries, but that its continuance is jeopardized through opposition.

The extensive industry dependent on the menhaden fishery is shown in Table 16.

In Maine the figures represent the importance of the business in the second year of the reappearance of menhaden in the coast waters of that State, after an absence of about ten years, and indicate a revival of the extensive industry which formerly existed there. Already the State is only slightly behind Connecticut in the amount of capital invested and the quantity of fish utilized, and the continued annual occurrence of large bodies of menhaden in this region will doubtless contribute to the rapid development of the business, if only reasonable restrictions are placed on the fishery.

Rhode Island has much more important menhaden interests than both Maine and Connecticut combined. The returns for this State show $452,925 invested capital, 177,133,333 menhaden utilized, 1,782,145 gallons of oil manufactured, and 7,397 tons of scrap made, the two latter articles having a value of $427,757, or more than two-thirds the amount accruing from the industry in New England.

16.—Table showing the extent of the menhaden industry of the New England States in 1889.

States.	Steam vessels employed.				Sail vessels employed.				Total vessels employed.			
	No.	Net tonnage.	Value.	Value of outfit.	No.	Net tonnage.	Value.	Value of outfit.	No.	Net tonnage.	Value.	Value of outfit.
Maine	4	218.22	$32.000	$8,800	13	398.10	$15,950	$13,065	17	616.32	$47,950	$21,865
Rhode Island	11	758.45	133,000	27,000	7	146.93	5,325	3,600	18	905.38	138,325	30,600
Connecticut	6	451.80	61,500	10,000	4	41.49	1,835	320	10	493.29	63,335	10,320
Total	21	1,428.47	226,500	45,800	24	586.52	23,110	16.985	45	2,014.99	249,610	62,785

States.	Factories in operation.			Total capital invested in the industry.	Number of persons employed.		Menhaden handled.		Oil manufactured.		Scrap prepared.		Total value of manufactured products.
	No.	Value.	Cash capital.		Factorymen.	Fishermen.	No.	Price paid.	Gallons.	Value.	Tons.	Value.	
Maine	3	$22,200	$20,000	$112,015	104	195	26,057,583	$31,269	282,465	$62,409	2,305	24,735	$87,144
Rhode Island	4	208,000	76,000	452,925	358	215	177,133,333	265,700	1,782,145	320,743	7,397	107,014	427,757
Connecticut	4	83,200	25,500	182,355	82	133	37,360,700	52,927	233.228	53,110	2,893	45,956	99,066
Total	11	313,400	121,500	747,295	544	543	240,551,616	349,896	2,297,838	436,262	12,595	177,705	613,967

Frozen-herring trade.—In the "Statistical Review of the Coast Fisheries of the United States," covering the years 1887 and 1888, brief allusion was made to the frozen-herring trade, an industry which is now almost exclusively under the control of New England fishery capitalists. The importance of this trade to the fishing interests of the British Provinces and the United States is very great. The former are benefited by having the opportunity of selling products at remunerative prices, which otherwise could not find a satisfactory market in the winter season, while the vessels and men that are engaged in other branches of the American fisheries during the summer find profitable employment in winter in obtaining and marketing cargoes of frozen herring. These products are used for food and bait. The herring is a cheap and nutritious food. It is especially valuable when it can be obtained by the consumer in a perfectly fresh state, as is the case when it is marketed in a frozen condition. The value of herring for bait purposes is so well known as to obviate the necessity of more than a mere mention of it. It may not be so well understood, however, that adequate supplies of fresh herring could not be so easily and so cheaply obtained in any other manner.

Allusion should be made to the uncertainties which render this trade one of the most hazardous, from a financial standpoint, in which men ordinarily engage. The two

important factors, generally speaking, are fish and weather. Herring may be exceedingly abundant and cheap at the fishing stations, but if the weather is mild it is impossible to freeze a cargo if the natural temperature at the station is depended upon. On the other hand, the conditions of freezing may be all that could be desired, but the fish do not appear, and days, weeks, and months are passed in waiting. It has not been uncommon for vessels to be compelled to return without cargoes. There are uncertainties, too, even when fish have been obtained in good condition. An overstocked market brings the price down to a point where loss can not be avoided, and disadvantage to the fisherman may often result from a continuance of warm weather immediately after the sale of a cargo has begun, since the sale generally continues for several days or weeks, and mild weather causes the frozen herring to "slack up" and become unfit for market.

It is a matter for congratulation that recently success has been met with in freezing herring on board of vessels by artificial methods. As long ago as 1878, when Prof. Baird established his headquarters at Gloucester, Massachusetts, he suggested the importance of applying artificial methods to the freezing of herring for bait. Recently the system has been adopted with marked success. This eliminates many uncertainties attending the business and the method will doubtless be largely applied in the near future.

The supply is obtained, as will be seen in the tables, from Newfoundland and New Brunswick. During some seasons a few cargoes are received from Nova Scotia, but it is now very exceptional for vessels to visit the latter province for frozen herring. Formerly vessels from Massachusetts engaged in the trade with Newfoundland and New Brunswick, nearly an equal number visiting each province. Recently, however, there has been a marked change in this respect. The New Brunswick herring trade in winter is, with few exceptions, carried on by vessels belonging in Maine, while vessels from Massachusetts engage almost exclusively in voyages to Newfoundland. This is due in some measure to the fact that the Maine vessels employed in this trade are of comparatively small tonnage, and not so well fitted as those from Massachusetts to make long ocean voyages in midwinter. The proximity of the Maine ports to the fishing-grounds in New Brunswick also has its influence.

Both for market and bait purposes the Newfoundland herring are preferred by Americans and bring the highest price. This accounts chiefly for the fact that the largest and finest fishing schooners sailing from Massachusetts engage in the Newfoundland herring trade.

In 1889, 26 vessels, with a tonnage of 1,140.70, were engaged in the New Brunswick frozen-herring trade, and brought to the markets of the United States 6,289,000 herring, valued at $39,622. Forty-six vessels, of 4,267.98 aggregate tonnage, found employment in the frozen-herring trade with Newfoundland and brought to our markets 16,235,000 herring, valued at $239,675.

In addition to the herring brought to the United States on American vessels, a considerable quantity was imported on vessels sailing under the British flag. Table 18 shows that 2,593,000 pounds, valued at $33,939, were thus sold in our markets during 1889. This is, however, in addition to large quantities of frozen herring imported from the provinces on steamers. Many herring are shipped in this way from New Brunswick on the regular line of steamers plying between St. John and New England ports.

17.—Table showing the extent of the frozen-herring trade of the New England States in 1889.

Ports.*	Vessels.			Herring carried.	
	No.	Net tonnage.	Value.	No.	Value.
Trade with New Brunswick:					
Calais, Me	1	24.55	$800	140,000	$882
Eastport, Me	8	287.46	11,800	2,329,000	14,673
Lubec, Me	2	42.46	1,650	295,000	1,859
Ellsworth, Me	2	148.06	3,100	525,000	3,308
Deer Isle, Me	1	50.51	1,250	100,000	630
Belfast, Me	1	42.73	1,000	230,000	1,449
North Haven, Me	1	36.16	1,000	190,000	1,197
Portland, Me	1	53.80	1,800	330 000	2,079
Total for Maine ports	17	685.73	22,400	4, 39,000	26,077
Gloucester, Mass	8	400.67	13,913	1,924,000	12,121
Boston, Mass	1	54.30	800	226,000	1,424
Dennis, Mass	.....	.....	.....	.....	.....
Provincetown, Mass	.....	.....	.....	.....	.....
Total for Massachusetts ports	9	454.97	14,713	2,150,000	13,545
Grand total	26	1,140.70	37,113	6,289,000	39,622
Trade with Newfoundland:					
Portland, Me	2	194.66	13,000	770,000	7,700
Gloucester, Mass	37	3,458.08	216,546	13,275,000	191,125
Boston, Mass	†3	233.38	13,800	1,030,000	15,450
Dennis, Mass	1	99.99	7,000	400,000	6,000
Provincetown, Mass	3	281.87	11,500	760,000	11,400
Total for Massachusetts ports	44	4,073.32	248,846	15,465,000	231,975
Grand total	46	4,267.98	261,846	16,235,000	239,675
Total trade:					
Calais, Me	1	24.55	800	140,000	882
Eastport, Me	8	287.46	11,800	2,329,000	14,673
Lubec, Me	2	42.46	1,650	295,000	1,859
Ellsworth, Me	2	148.06	3,100	525,000	3,308
Deer Isle, Me	1	50.51	1,250	100,000	630
Belfast, Me	1	42.73	1,000	230,000	1,449
North Haven, Me	1	36.16	1,000	190,000	1,197
Portland, Me	3	248.46	14,800	1,100,000	9,779
Total for Maine ports	19	880.39	35,400	4,909,000	33,777
Gloucester, Mass	45	3,858.75	230,459	15,199,000	211,246
Boston, Mass	4	287.68	14,600	1,256,000	16,874
Dennis, Mass	1	99.99	7,000	400,000	6,000
Provincetown, Mass	3	281.87	11,500	760,000	11,400
Total for Massachusetts ports	53	4,528.29	263,559	17,615,000	245,520
Grand total	72	5,408.68	298,959	22,524,000	279,297

* The names given are those of the hailing ports from which the vessels sail. The products are chiefly marketed at Gloucester, Boston, and New York.

† Including one vessel belonging at Philadelphia, Pa., which landed one fare at Boston.

18.—Table showing the quantity and value of frozen herring landed in the New England States by Canadian vessels in 1889.

Where from.	Boston.		Gloucester.		Total.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Newfoundland	1,425,000	$21,375	530,000	$7,950	1,955,000	$29,325
Nova Scotia	180,000	1,134	350,000	2,800	530,000	3,934
New Brunswick	108,000	680	.....	.....	108,000	680
Total	1,713,000	23,189	880,000	10,750	2,593,000	33,939

II.—THE FISHERIES OF MAINE.

GENERAL REMARKS AND STATISTICS.

Next to Massachusetts, the fisheries of Maine are of more importance than those of any other New England State, and, omitting Massachusetts, are about equal, in point of value, to those of all the other New England States combined. In certain branches this State takes first rank, noticeably in the shore fisheries for cod, herring, lobsters, and clams, and in the shore industries related to or dependent on the fisheries, such as sardine and lobster canning and herring smoking.

The figures represent all the coast and river fisheries of Maine of commercial importance. The minor streams were canvassed in their entirety; the St. Croix was investigated to Calais, the Penobscot to Bangor, the Sheepscot to Wiscasset, and the Kennebec to Woolwich.

In the three general tables which follow, the condensed statistics for this State are given.

19.—Table of persons employed.

How engaged.	No.
On fishing vessels	2,515
On transporting vessels	165
In shore fisheries	6,205
On shore, in factories, fish-houses, etc	5,244
Total	14,129

20.—Table of apparatus and capital.

Designation.	No.	Value.
Vessels fishing (tonnage 11,476.44)	349	$523,690
Outfit	.....	201,487
Vessels transporting (tonnage 1,660.23)	59	75,475
Outfit	.....	13,100
Boats	5,908	215,534
Boats transporting only	82	21,935
Apparatus of capture—vessel fisheries:		
Seines	56	27,600
Gill nets	1,540	15,400
Trawl lines and hand lines	.....	95,261
Pots	6,715	6,905
Harpoons	96	722
Dredges and rakes	.....	50
Apparatus of capture—shore fisheries:		
Weirs	273	52,022
Trap nets	341	33,000
Pound nets	33	14,895
Gill nets	3,561	32,973
Bag nets	280	11,570
Fyke nets	134	450
Hand lines and trawl lines	.....	14,790
Eel pots	111	144
Lobster pots	121,140	108,668
Seines	75	5,325
Spears	158	165
Dredges	123	1,603
Miscellaneous nets	107	337
Clamming apparatus	.....	1,584
Shore property	.....	743,808
Cash capital	.....	671,300
Total	.....	2,889,893

21.—Table of products.

Species.	Vessel fisheries.		Shore fisheries.		Total.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Alewives, fresh	28,000	$195	2,360,225	$12,958	2,388,225	$13,153
Alewives, salted	14,000	161	598,180	8,498	612,180	8,659
Alewives, smoked	.....	.....	357,714	8,596	357,714	8,596
Bream, fresh	.....	.....	26,000	270	26,000	270
Butter-fish, fresh	.....	.....	27,000	445	27,000	445
Catfish, fresh	.....	.....	6,000	120	6,000	120
Cod, fresh	3,690,570	72,300	2,361,902	50,505	6,052,472	122,805
Cod, salted	9,961,556	275,538	1,520,682	38,853	11,482,238	314,391
Cunners, fresh	60,000	1,200	44,100	1,423	104,100	2,623
Cusk, fresh	86,500	760	281,100	3,881	367,600	4,641
Cusk, salted	129,970	1,315	23,559	240	153,529	1,555
Eels, fresh	7,250	610	95,895	8,125	103,145	8,735
Flounders, fresh	.....	.....	829,475	15,815	829,475	15,815
Frostfish or tomcod, fresh	.....	.....	348,550	3,236	348,550	3,236
Haddock, fresh	2,381,950	41,782	2,386,759	40,589	4,768,709	82,371
Haddock, salted	737,534	8,531	782,592	11,738	1,520,126	20,269
Hake, fresh	699,752	6,023	2,216,386	21,232	2,916,138	27,255
Hake, salted	3,791,924	40,668	1,416,547	21,248	5,208,471	61,916
Halibut, fresh	339,453	24,891	159,910	11,064	499,363	35,955
Halibut, salted	600	36	.....	.....	600	36
Herring, fresh	618,900	4,680	17,350,331	71,579	17,969,231	76,259
Herring, salted	2,497,200	34,827	2,712,725	28,846	5,209,925	63,673
Herring, smoked	.....	.....	3,185,925	99,639	3,185,925	99,639
Mackerel, fresh	181,251	14,472	236,190	21,602	417,441	36,074
Mackerel, salted	562,100	51,904	.....	.....	562,100	51,904
Menhaden, fresh	8,498,860	18,805	1,685,900	9,479	10,184,760	28,284
Pollock, fresh	1,380,513	12,906	958,003	9,669	2,338,516	22,575
Pollock, salted	575,176	5,804	383,546	4,000	958,722	9,804
Red snapper, fresh	285,000	7,100	.....	.....	285,000	7,100
Salmon, fresh	.....	.....	152,740	34,118	152,740	34,118
Shad, fresh	18,000	675	869,800	18,012	887,800	18,687
Smelt, fresh	10,000	900	1,045,385	74,077	1,055,385	74,977
Swordfish, fresh	634,435	26,817	.....	.....	634,435	26,817
Waste fish, fresh	.....	.....	448,400	1,755	448,400	1,755
Lobsters	549,240	17,432	24,452,111	556,733	25,001,351	574,165
Scallops	32,614	1,950	262,685	16,697	*295,299	18,647
Clams (soft), fresh	35,020	1,582	2,207,072	72,359	†2,242,092	73,941
Clams (soft), salted	.....	.....	6,181,600	126,820	‡6,181,600	126,820
Quahogs	.....	.....	800	100	§800	100
Algæ	.....	.....	12,900,000	6,315	12,900,000	6,315
Cod tongues	151,426	3,028	10,138	203	161,564	3,231
Cod and hake sounds	60,198	1,505	42,925	1,074	103,123	2,579
Oil	339,838	12,570	272,182	8,326	‖612,020	20,896
Total	38,358,830	690,967	91,201,034	1,420,239	129,559,864	2,111,206

*45,368 bushels. †224,209 bushels. ‡30,908 barrels. §100 bushels. ‖81,603 gallons.

THE VESSEL FISHERIES.

The vessel fisheries of Maine, while of considerable importance, are much less extensive than the shore fisheries, so far as the results of the industry are concerned. Their specially prominent feature is the large number of vessels of small size fishing on shore grounds. The herring and lobster fisheries are more important than in any other State. The mackerel fleet is relatively large. The vessels fishing for cod on the great offshore banks are comparatively few in number, but include some of the finest schooners in the New England fleet.

In the following tables the vessel fisheries are exhibited from four points of view, viz, by counties, by customs districts, by apparatus, and by fisheries.

Three tables give the details by counties. Vessels are employed in all the coast counties, eight in number.

The first table shows that of 2,680 persons in this branch, 2,515 were on fishing vessels and 165 on fishery transports. Cumberland County leads all others in the number of vessel fishermen, 857 persons, or 32 per cent, being credited to it. This is

followed by Hancock, Lincoln, and Knox counties, with from about 400 to 700 men each; Washington, with over 200; and York, Sagadahoc, and Waldo, with less than 100 each, the last-named county having only 4 vessel fishermen.

It is interesting to observe that 267 aliens are found among the Maine vessel fishermen. This is equivalent to 10 per cent of the whole number. The British provincial element greatly predominates, numbering 246, or 92 per cent of all aliens. Lincoln has more foreign vessel fishermen than any other county, after which are Cumberland and Hancock counties. The other counties have only a very small proportion of unnaturalized fishermen.

Table 23 shows that 349 fishing vessels and 59 transporters were employed in the waters of Maine in 1889, worth, with their outfits and apparatus, $959,090. Hancock County has the greatest number of vessels, although Cumberland County leads in tonnage and value. Of the vessels used in transporting fishery products, nearly half were owned in Washington County.

Purse seines to the number of 56 are used in five counties, Cumberland being credited with 31. Gill nets are found in every county, the total number fished being 1,540, of which Knox and Lincoln counties each have 360. Lines are the most valuable form of apparatus in the vessel fisheries, and are used in all the counties except Waldo. Lobster pots are naturally the most numerous apparatus and are employed to the number of 6,715 in all the counties but Waldo and Sagadahoc, the greatest number being in Washington County. Harpoons, dredges, and rakes complete the list; these are only sparingly used.

The products of the vessel fisheries, as shown in the third table of the series, amounted to 38,358,830 pounds, for which the fishermen received $690,967. Cumberland County leads all others in the quantity and value of products, being credited with nearly one-third the yield and more than one-third of the value of the catch in the entire State. Lincoln County ranks second in quantity of products, but is surpassed by Hancock in the value of output. Each of five counties shows products amounting to from over 1,000,000 pounds to upwards of 12,000,000. Cod, the most important species, is taken in largest quantity in Cumberland County, but the value of the cod caught by Hancock County vessels is greater than in Cumberland County, owing to the condition in which the product is sold.

22.—Table showing by counties the number and nationality of men employed in the vessel fisheries of Maine in 1889.

Counties.	Number and nationality of men on fishing vessels.				Number and nationality of men on transporting vessels.		
	Americans.	British provincials.	All others.	Total.	Americans.	British provincials.	Total.
Washington	130	5	.....	135	82	4	86
Hancock	631	55	13	699	31	.....	31
Waldo	2	.....	.....	2	2	.....	2
Knox	355	12	1	368	20	.....	20
Lincoln	298	101	2	401	3	.....	3
Sagadahoc	18	.....	.....	18	.....	.....	.....
Cumberland	760	69	5	834	23	.....	23
York	58	.....	.....	58	.....	.....	.....
Total	2,252	242	21	2,515	161	4	165

23.—Table showing by counties the number and value of vessels and apparatus employed in the vessel fisheries of Maine in 1889.

Counties.	Vessels.							
	Fishing.				Transporting.			
	No.	Net tonnage.	Value.	Value of outfit.	No.	Net tonnage.	Value.	Value of outfit.
Washington	29	465.59	$13,900	$6,406	27	861.79	$44,350	$6,630
Hancock	95	3,521.39	135,875	88,488	11	339.89	12,975	2,225
Waldo	1	8.20	300	100	1	9.98	450	100
Knox	67	1,616.62	65,425	24,642	8	200.12	5,500	1,550
Lincoln	56	1,650.56	85,760	27,481	1	32.04	2,500	75
Sagadahoc	4	75.04	2,700	1,000	.....	.....	.....	.....
Cumberland	84	3,953.73	211,030	51,128	11	216.41	9,700	2,520
York	13	185.31	8,700	2,242	.....	.....	.....	.....
Total	349	11,476.44	523,690	201,487	59	1,660.23	75,475	13,100

Counties.	Apparatus of capture.												Total investment.
	Seines.		Gill nets.		Lines.		Pots.		Harpoons.		Dredges and rakes.		
	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	
Washington	1	$500	109	$1,090	....	$2,529	2,310	$2,350	.....	.....	.....	.....	$77,755
Hancock	5	2,700	338	3,380	....	16,014	1,000	1,000	.....	.....	.....	$48	262,705
Waldo	.....	.....	8	80	.....	.....	.....	.....	.....	.....	.....	.....	1,030
Knox	6	2,850	360	3,600	....	13,501	1,000	1,000	16	$122	.....	.....	117,5.0
Lincoln	13	6,050	360	3,600	....	13,109	605	605	.....	.....	.....	.....	139,180
Sagadahoc	.....	.....	60	600	....	974	.....	.....	.....	.....	.....	.....	5,274
Cumberland	31	15,500	235	2,350	....	44,793	550	700	72	540	.....	.....	338,261
York	.....	.....	70	700	....	4,341	1,250	1,250	8	60	....	2	17,295
Total	56	27,600	1,540	15,400	....	95,261	6,715	6,905	96	722	....	50	959,090

24.—Table showing by counties the yield of the vessel fisheries of Maine in 1889.

Species.	Washington.		Hancock.		Waldo.		Knox.		Lincoln.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Alewives, fresh	.....	.....	.....	.....	.....	.....	.....	.....	28,000	$195
Alewives, salted	.....	.....	.....	.....	.....	.....	.....	.....	14,000	161
Cod, fresh	22,000	$475	71,540	$1,220	.....	.....	143,093	$2,625	315,500	4,671
Cod, salted	256,730	6,447	4,499,306	142,829	.....	.....	753,660	17,734	1,634,300	38,235
Cusk, salted	.....	.....	14,140	150	.....	.....	77,600	788	30,120	295
Haddock, fresh	18,500	345	41,772	616	.....	.....	307,804	4,131	413,500	6,867
Haddock, salted	19,250	261	134,806	1,494	.....	.....	319,780	3,698	47,040	533
Hake, fresh	19,550	186	14,400	125	.....	.....	370,215	2,944	118,000	1,070
Hake, salted	152,340	2,105	1,496,127	15,864	.....	.....	1,204,840	12,458	356,790	4,062
Halibut, fresh	16,515	1,002	43,850	2,566	.....	.....	500	25	15,700	1,118
Halibut, salted	.....	.....	600	36	.....	.....	.....	.....	.....	.....
Herring, fresh	.....	.....	217,800	1,874	.....	.....	127,000	629	72,600	545
Herring, salted	250,000	3,911	491,600	7,086	34,000	$510	961,400	12,795	557,200	7,430
Mackerel, fresh	.....	.....	350	28	.....	.....	77,671	5,204	22,825	1,844
Mackerel, salted	14,400	1,441	54,800	5,250	.....	.....	75,800	6,965	134,100	12,826
Menhaden, fresh	.....	.....	98,460	219	.....	.....	998,000	2,865	6,497,200	13,366
Pollock, fresh	.....	.....	.....	.....	.....	.....	8,000	60	183,200	1,480
Pollock, salted	56,988	663	158,335	1,562	.....	.....	61,800	582	115,420	1,177
Swordfish, fresh	.....	.....	.....	.....	.....	.....	60,235	2,590	.....	.....
Lobsters	169,440	4,395	35,600	1,218	.....	.....	170,800	4,825	43,000	1,732
Scallops	.....	.....	32,614	1,950	.....	.....	.....	.....	.....	.....
Clams, soft	2,500	100	.....	.....	.....	.....	.....	.....	14,720	770
Tongues	3,890	78	68,671	1,374	.....	.....	11,420	228	24,762	495
Sounds	2,478	62	23,948	599	.....	.....	19,144	479	5,663	141
Oil	7,877	291	99,935	3,697	.....	.....	49,850	1,844	45,557	1,686
Total	1,012,458	21,762	7,598,654	189,757	34,000	510	5,798,612	83,478	10,689,197	100,699

24.—Table showing by counties the yield of the vessel fisheries of Maine in 1889—Continued.

Species.	Sagadahoc.		Cumberland.		York.		Total for the State.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Alewives, fresh							28,000	$195
Alewives, salted							14,000	161
Cod, fresh	50,931	$845	2,952,706	$59,870	134,800	$2,594	3,690,570	72,309
Cod, salted	41,000	850	2,600,560	65,735	176,000	3,708	9,961,556	275,538
Cunners, fresh			60,000	1,200			60,000	1,200
Cusk, fresh			5,000	45	81,500	715	86,500	760
Cusk, salted			8,110	82			129,970	1,315
Eels, fresh			7,250	610			7,250	610
Haddock, fresh	23,673	355	1,387,201	25,969	189,500	3,499	2,381,950	41,782
Haddock, salted	13,330	135	192,828	2,300	10,000	110	737,534	8,531
Hake, fresh	8,587	80	141,250	1,375	27,750	243	699,752	6,023
Hake salted	30,356	325	494,471	5,104	57,000	750	3,791,924	40,668
Halibut, fresh	4,198	250	257,790	19,870	900	60	339,453	24,891
Halibut, salted							600	36
Herring, fresh	28,000	230	124,000	1,020	49,500	382	618,900	4,680
Herring, salted	60,000	825	136,000	2,155	7,000	115	2,497,200	34,827
Mackerel, fresh	4,005	380	66,700	6,123	9,700	893	181,251	14,472
Mackerel, salted			279,800	25,182	3,200	240	562,100	51,904
Menhaden, fresh			896,200	2,325	9,000	30	8,498,860	18,805
Pollock, fresh			1,189,313	11,366			1,380,513	12,906
Pollock, salted	12,257	120	170,376	1,700			575,176	5,804
Red snapper, fresh			285,000	7,100			285,000	7,100
Shad, fresh			18,000	675			18,000	675
Smelt, fresh			10,000	900			10,000	900
Swordfish, fresh			543,600	22,998	30,600	1,220	634,435	26,817
Lobsters			20,400	952	110,000	4,310	543,240	17,432
Scallops							32,614	1,950
Clams (soft)			17,000	680	800	32	35,020	1,582
Tongues	621	12	39,402	788	2,660	53	151,426	3,028
Sounds	482	12	7,575	189	908	23	60,198	1,505
Oil	2,715	98	124,306	4,599	9,598	355	339,838	12,570
Total	280,655	4,517	12,034,838	270,912	910,416	19,332	38,358,830	690,967

In the two following tables certain averages and percentages are shown which exhibit the different interests possessed by different counties.

From the first table it is seen that the largest vessels are found in Cumberland County and the smallest in Waldo County. The average value is also greatest in Cumberland County and least in Waldo County. The average value per net ton ranges from $30 to $53, being greatest in Cumberland County and least in Washington County. In Cumberland County the average number of men carried on vessels is nearly 10, while in Waldo County it is only 2. York County takes precedence in the items of average value of catch per man, per ton, and per each $100 invested, while in Cumberland County the average stock per vessel is much in excess of any other county.

The relative value of the various fishery products in the vessel fisheries of each county is next shown. The greatest proportion of fresh cod is taken in Cumberland County, and of salt cod in Hancock County, although Sagadahoc and York counties are also credited with a considerable percentage of fresh cod, and in all the counties but Waldo the proportional value of salt cod is greater than that of any other species. York County leads in the relative value of fresh haddock; Knox in salt haddock, and fresh and salt hake; Sagadahoc in fresh herring and mackerel; Waldo in salt herring; Lincoln in salt mackerel and menhaden; Cumberland in fresh pollock, halibut, and swordfish; and York in cusk and lobster.

25.—Table showing by counties certain average figures for the vessels employed in the fisheries of Maine in 1889.

Counties.	Net tonnage.	Value per ton.	Value per vessel.	Value of apparatus and outfit.	No. of men to vessel.	Value of catch per man.	Value of catch per vessel.	Value of catch per each ton employed.	Value of catch per each $100 invested in fishing vessels.
Washington	16.05	$30	$479	$444	5	$161	$750	$47	$81
Hancock	37.06	39	1,430	1,175	7	271	1,997	54	76
Waldo	8.20	37	300	180	2	255	510	62	106
Knox	24.13	40	976	682	5	227	1,246	52	75
Lincoln	29.47	52	1,531	908	7	251	1,798	61	74
Sagadahoc	18.76	36	675	644	5	251	1,129	60	85
Cumberland	47.07	53	2,512	1,370	10	325	3,225	69	83
York	14.25	46	669	661	4	333	1,487	104	112

26.—Table showing by counties the percentage of value of each species or product taken in the vessel fisheries of Maine in 1889.

Species.	Washington.	Hancock.	Waldo.	Knox.	Lincoln.	Sagadahoc.	Cumberland.	York.
Alewives, fresh					.19			
Alewives, salted					.16			
Cod, fresh	2.18	.64		3.15	4.64	18.71	22.10	13.42
Cod, salted	29.63	75.27		21.24	37.97	18.82	24.26	19.18
Cunners, fresh							.44	
Cusk, fresh							.02	3.70
Cusk, salted		.08		.95	.29		.03	
Eels, fresh							.23	
Haddock, fresh	1.59	.32		4.95	6.82	7.86	9.59	18.10
Haddock, salted	1.20	.79		4.43	.53	2.99	.85	.57
Hake, fresh	.85	.07		3.53	1.06	1.77	.51	1.26
Hake, salted	9.67	8.36		14.92	4.03	7.19	1.88	3.88
Halibut, fresh	4.60	1.35		.03	1.11	5.53	7.33	.31
Halibut, salted		.02						
Herring, fresh		.99		.75	.54	5.09	.38	1.98
Herring, salted	17.97	3.73	100.00	15.33	7.38	18.26	.80	.59
Mackerel, fresh		.01		6.24	1.83	8.41	2.26	4.62
Mackerel, salted	6.62	2.77		8.34	12.74		9.29	1.24
Menhaden, fresh		.12		3.43	13.27		.86	.16
Pollock, fresh				.07	1.47		4.19	
Pollock, salted	3.05	.82		.70	1.17	2.66	.63	
Red snapper, fresh							2.62	
Shad, fresh							.25	
Smelt, fresh							.33	
Swordfish, fresh				3.11			8.49	6.31
Lobsters	20.20	.64		5.78	1.72		.35	22.29
Scallops		1.03						
Clams	.46				.77		.25	.16
Tongues	.36	.72		.27	.49	.27	.29	.27
Sounds	.28	.32		.57	.14	.27	.07	.12
Oil	1.34	1.95		2.21	1.68	2.17	1.70	1.84
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

In considering the vessel fisheries of Maine by customs districts, the most noticeable feature is the great preponderance of the Portland district in the matters of tonnage, value of vessels, number of crew, and stock of fishing vessels, although the number of fishing craft in the Waldoboro district is nearly as great as in Portland. The Passamaquoddy district leads all others in the extent and importance of its transporting fleet, the frozen-herring trade being a prominent feature of the fishing interests of the region.

Examination of the products table will show the districts in which the greatest quantities of each species are landed. The Portland district is conspicuous for the greatest catch of cod, haddock, mackerel, and swordfish, and Waldoboro leads in the yield of menhaden, hake, herring, pollock, and lobster.

27.—Summary by customs districts of the vessel fisheries of Maine in 1889.

Customs districts.	No. of vessels fishing.	Net tonnage.	Value of vessel.	Value of outfit, gear, provisions, fuel, etc.	Number and nationality of fishermen.				Value of catch.*
					Americans.	British provincials.	All others.	Total.	
Passamaquoddy	4	141.68	$3,900	$2,850	31	5	.....	36	$3,060
Machias	23	306.81	9,400	9,525	91	.....	.....	91	17,756
Frenchmans Bay	41	1,845.36	77,225	59,250	314	44	1	359	93,284
Castine	56	1,693.13	59,250	52,880	325	11	12	348	91,318
Belfast	14	515.37	21,225	21,555	118	3	.....	121	20,741
Waldoboro	80	1,511.08	58,735	37,280	361	9	1	371	92,559
Wiscasset	29	1,169.76	65,525	35,905	165	101	2	268	61,384
Bath	4	75.04	2,700	2,574	18	.....	.....	18	4,395
Portland	84	4,012.46	216,080	116,161	765	69	5	839	269,256
Saco	3	24.35	1,650	1,260	11	.....	.....	11	3,530
Kennebunk	9	165.58	7,500	7,610	48	.....	.....	48	15,849
York	2	15.82	500	575	5	.....	.....	5	732
Total	349	11,476.44	523,690	347,425	2,252	242	21	2,515	673,864

Customs districts.	No. of vessels transporting.	Net tonnage.	Value of vessel.	Value of provisions, fuel, etc.	Number and nationality of crew.				Value of products transported.
					Americans.	British provincials.	All others.	Total.	
Passamaquoddy	23	747.58	$36,150	$5,530	71	4	.....	75	$68,080
Machias	4	114.21	8,200	1,100	11	.....	.....	11	8,500
Frenchmans Bay	5	268.87	6,100	1,025	18	.....	.....	18	18,600
Castine	6	71.02	6,875	1,200	13	.....	.....	13	18,200
Belfast	3	88.87	2,450	400	8	.....	.....	8	5,350
Waldoboro	7	153.27	6,000	1,325	17	.....	.....	17	25,775
Wiscasset	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bath	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portland	11	216.41	9,700	2,520	23	.....	.....	23	56,939
Saco	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kennebunk	.....	.....	.....	.....	.....	.....	.....	.....	.....
York	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	59	1,660.23	75,475	13,100	161	4	.....	165	201,444

* In addition to the values given, $17,103 should be added for oil, cod tongues, and sounds.

28.—Table showing by species and customs districts the yield of the vessel fisheries of Maine in 1889.

Species.	Passamaquoddy.		Machias.		Frenchmans Bay.		Castine.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Cod, fresh	.....	.....	22,000	$475	38,840	$725	32,700	$495
Cod, salted	65,010	$1,515	185,640	4,770	2,461,622	75,112	2,043,764	67,879
Cusk, salted	.....	.....	.....	.....	12,140	135	2,000	15
Haddock, fresh	.....	.....	18,500	345	7,822	113	33,950	503
Haddock, salted	.....	.....	18,450	251	65,106	779	70,500	725
Hake, fresh	.....	.....	19,550	186	8,400	75	6,000	50
Hake, salted	.....	.....	133,240	1,821	871,481	9,487	643,746	6,661
Halibut, fresh	.....	.....	16,250	987	31,415	1,754	12,700	827
Halibut, salted	.....	.....	.....	.....	600	36	.....	.....
Herring, fresh	.....	.....	.....	.....	30,500	247	187,300	1,627
Herring, salted	.....	.....	250,000	3,911	175,000	2,475	316,600	4,611
Mackerel, fresh	.....	.....	.....	.....	.....	.....	350	28
Mackerel, salted	14,400	1,441	.....	.....	.....	.....	54,800	5,250
Menhaden, fresh	.....	.....	.....	.....	98,460	219	.....	.....
Pollock, salted	11,620	104	41,868	515	118,235	1,182	43,600	424
Lobsters	.....	.....	169,440	4,395	27,000	945	8,600	273
Scallops	.....	.....	.....	.....	.....	.....	32,614	1,950
Clams (soft)	.....	.....	2,500	100	.....	.....	.....	.....
Total	91,030	3,060	877,438	17,756	3,946,621	93,284	3,489,224	91,318

28.—*Table showing by species and customs districts the yield of the vessel fisheries of Maine in 1889*—Cont'd.

Species.	Belfast.		Waldoboro.		Wiscasset.		Bath.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Alewives, fresh	.....	.....	20,000	$115	8,000	$80	.....	.....
Alewives, salted	.....	.....	*14,000*	*161*	.....	.....	.....	.....
Cod, fresh	29,000	$490	174,593	3,122	255,000	3,684	50,931	$845
Cod, salted	237,000	5,720	723,960	17,059	1,427,000	33,190	41,000	850
Cusk, salted	19,000	210	88,720	873	.....	.....	.....	.....
Haddock, fresh	227,850	3,067	92,954	1,171	400,500	6,760	23,673	355
Haddock, salted	95,000	1,040	268,820	3,146	3,000	45	13,830	135
Hake, fresh	1,550	15	484,665	3,974	2,000	25	8,587	80
Hake, salted	290,000	3,030	1,208,630	12,620	63,000	870	30,356	325
Halibut, fresh	500	25	.....	.....	15,700	1,118	4,198	250
Herring, fresh	.....	.....	199,600	1,174	.....	.....	28,000	230
Herring, salted	34,000	510	1,349,600	18,350	169,000	1,875	60,000	825
Mackerel, fresh	1,600	120	88,896	6,028	.....	.....	4,005	380
Mackerel, salted	59,800	5,625	19,800	1,706	86,300	8,500	.....	.....
Menhaden, fresh	18,000	75	6,721,200	13,886	720,000	2,000	.....	.....
Pollock, fresh	.....	.....	91,900	795	99,300	745	.....	.....
Pollock, salted	.....	.....	127,220	1,259	50,000	500	12,257	120
Swordfish, fresh	19,100	694	41,135	1,905	.....	.....	.....	.....
Lobsters	4,800	120	180,000	5,215	29,000	1,222	.....	.....
Clams (soft)	.....	.....	.....	.....	14,720	770	.....	.....
Total	1,037,200	20,741	11,895,693	92,559	3,342,520	61,384	276,837	4,395

Species.	Portland.		Saco.		Kennebunk.		York.		Total for State.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Alewives, fresh	.....	.....	.....	.....	.....	.....	.....	.....	28,000	$195
Alewives, salted	.....	.....	.....	.....	.....	.....	.....	.....	14,000	161
Cod, fresh	2,912,706	$59,070	21,700	$433	141,600	$2,726	11,500	$235	3,690,570	72,300
Cod, salted	2,600,560	65,735	.....	.....	176,000	3,708	.....	.....	9,961,556	275,538
Cunners, fresh	60,000	1,200	.....	.....	.....	.....	.....	.....	60,000	1,200
Cusk, fresh	5,000	45	.....	.....	65,000	585	16,500	130	86,500	760
Cusk, salted	8,110	82	.....	.....	.....	.....	.....	.....	129,970	1,315
Eels, fresh	7,250	610	.....	.....	.....	.....	.....	.....	7,250	610
Haddock, fresh	1,377,201	25,769	15,500	310	180,500	3,329	3,500	60	2,381,950	41,782
Haddock, salted	192,828	2,300	.....	.....	*10,000*	*110*	.....	.....	737,534	8,591
Hake, fresh	141,250	1,375	.....	.....	21,750	188	6,000	55	699,752	6,023
Hake, salted	494,471	5,104	.....	.....	57,000	750	.....	.....	3,791,924	40,668
Halibut, fresh	254,790	19,660	.....	.....	3,900	270	.....	.....	339,453	24,891
Halibut, salted	.....	.....	.....	.....	.....	.....	.....	.....	600	36
Herring, fresh	124,000	1,020	2,300	22	27,200	190	20,000	170	618,900	4,680
Herring, salted	136,000	2,155	.....	.....	7,000	115	.....	.....	2,497,200	34,827
Mackerel, fresh	76,700	7,023	1,200	120	8,000	723	500	50	181,251	14,472
Mackerel, salted	323,800	29,142	200	15	3,000	225	.....	.....	502,100	51,904
Menhaden, fresh	932,200	2,595	.....	.....	9,000	30	.....	.....	8,498,860	18,805
Pollock, fresh	1,189,313	11,366	.....	.....	.....	.....	.....	.....	1,380,513	12,906
Pollock, salted	170,376	1,700	.....	.....	.....	.....	.....	.....	575,176	5,804
Red snapper, fresh	285,000	7,100	.....	.....	.....	.....	.....	.....	285,000	7,100
Shad, fresh	18,000	675	.....	.....	.....	.....	.....	.....	18,000	675
Smelt, fresh	10,000	900	.....	.....	.....	.....	.....	.....	10,000	900
Swordfish, fresh	543,600	22,998	800	30	29,800	1,190	.....	.....	634,435	26,817
Lobsters	20,400	952	60,000	2,600	50,000	1 710	.....	.....	549,240	17,432
Scallops	.....	.....	.....	.....	.....	.....	.....	.....	32,614	1,950
Clams (soft)	17,000	680	.....	.....	.....	.....	800	32	35,020	1,582
Total	11,900,555	269,256	101,700	3,530	789,750	15,849	58,800	732	37,807,368	673,864

Table 29, based on the preceding, gives certain average figures for the vessels in the various districts. The points shown are average tonnage, average value, average value of apparatus and outfit, average number of crew, and average gross stock.

29.—Table showing by customs districts the average tonnage, value, crew, and stock of vessels employed in the fisheries of Maine in 1889.

Customs districts.	Average tonnage.		Average value.		Average value of outfit and apparatus.		Average number of crew.		Average gross stock.	
	Fishing.	Transporting.	Fishing.	Transporting.	Fishing.	Transporting.	Fishing.	Transporting.	Fishing.	Transporting.
Passamaquoddy	35.42	32.50	$975	$1,572	$713	$240	9	3	$765	$2,960
Machias	13.34	28.55	409	2,050	414	275	4	3	772	2,125
Frenchmans Bay	45.01	53.77	1,884	1,220	1,443	205	9	4	2,275	3,720
Castine	30.23	11.84	1,058	1,146	944	200	6	2	1,631	3,033
Belfast	36.81	29.62	1,516	817	1,540	133	9	3	1,482	1,783
Waldoboro	18.89	21.90	734	857	466	189	5	2	1,157	3,682
Wiscasset	40.34	.....	2,259	.....	1,258	.....	9	.....	2,117	.....
Bath	18.76	.....	675	.....	644	.....	5	.....	1,086	.....
Portland	47.77	19.67	2,572	882	1,383	229	10	2	3,205	5,176
Saco	8.12	.....	550	.....	420	.....	4	.....	1,177	.....
Kennebunk	18.40	.....	833	.....	846	.....	5	.....	1,761	.....
York	7.91	.....	250	.....	288	.....	3	.....	366	.....

* The value of products transported.

The relative importance of the different kinds of apparatus employed in the vessel fisheries in the capture of fish is shown in Table 30. It appears that by means of hand lines and trawl lines 24,126,298 pounds of fish, valued at $503,267, were taken, these figures representing about 65 per cent of the total catch and 77 per cent of the aggregate value. Salt cod is by far the most important item in the line fishery, the value of this species in this condition being more than that of all the other line fish combined. Seines rank next to lines in both quantity and value of fish. Of the 9,030,960 pounds taken by this means, 8,498,860 pounds were menhaden; but of the total value of seine-caught fish, viz, $67,777, mackerel represented $48,297. After seines come gill nets with 3,391,551 pounds, worth $54,429, of which the herring amounted to 3,116,100 pounds, valued at $39,507. Harpoons and pots complete the list of apparatus in the vessel fisheries; the catch by these forms is restricted to swordfish and eels, and is necessarily insignificant in comparison with the other kinds of apparatus, although the 634,435 pounds of swordfish, valued at $26,817, represent an important fishery.

30.—Table showing by apparatus and species the yield of the vessel fisheries of Maine in 1889, exclusive of the molluscan and crustacean fisheries.

Apparatus and species.	Pounds.	Value.	Apparatus and species.	Pounds.	Value.
Seines:			Lines:		
Mackerel, fresh	33,500	$3,135	Cod, fresh	3,690,570	$72,300
Mackerel, salted	480,600	45,162	Cod, salted	9,961,556	275,538
Menhaden, fresh	8,498,860	18,805	Cusk, fresh	86,500	760
Shad, fresh	18,000	675	Cusk, salted	129,970	1,315
Total	9,030,960	67,777	Haddock, fresh	2,381,950	41,782
Gill nets:			Haddock, salted	737,534	8,531
Alewives, fresh	28,000	195	Hake, fresh	699,752	6,023
Alewives, salted	14,000	161	Hake, salted	3,791,924	40,668
Cunners or perch, fresh	60,000	1,200	Halibut, fresh	339,453	24,891
Herring, fresh	618,900	4,680	Halibut, salted	600	36
Herring, salted	2,497,200	34,827	Mackerel, fresh	15,300	1,373
Mackerel, fresh	132,451	9,964	Mackerel, salted	50,500	4,240
Mackerel, salted	31,000	2,502	Pollock, fresh	1,380,513	12,906
Smelt, fresh	10,000	900	Pollock, salted	575,176	5,804
Total	3,391,551	54,429	Red snapper, fresh	285,000	7,100
Pots:			Total	24,126,298	503,267
Eels, fresh	7,250	610	Grand total	37,190,494	652,900
Harpoons:					
Swordfish, fresh	634,435	26,817			

As already explained in discussing the general statistics which precede the chapter on the fisheries of Maine, in the presentation by fisheries each vessel is credited in the following table to all the fisheries in which it was engaged during any portion of the year, together with its tonnage, value, and crew, the object being to show the actual extent of each fishery. By far the greatest number of vessels were engaged in shore fishing, which is credited with 217 sail, after which come the herring fishery with 107 vessels, the mackerel fishery with 80 vessels, the bank cod fishery with 48 vessels, the lobster fishery with 29 vessels, and the swordfish fishery with 25 vessels.

31.—Table showing the number of vessels engaged in each fishery in Maine in 1889, together with their tonnage, value, and number of crew.

Fisheries.	No. of vessels engaged.	Net tonnage.	Value of vessels.	Number and nationality of fishermen.			
				Americans.	British provincials.	All others.	Total.
Cod, on banks east of 65° W. longitude	48	4,257.12	$214,900	581	191	1	773
Halibut	4	334.09	21,500	52	.....	.....	52
Mackerel, Gulf of St. Lawrence	4	327.90	20,500	67	.....	.....	67
Mackerel, New England and Cape shores	76	2,340.19	126,400	467	37	13	517
Shore	217	4,755.82	185,090	1,176	48	1	1,225
Market	18	1,210.62	64,900	212	25	7	244
Herring	107	1,908.01	69,000	454	.....	1	455
Swordfish	25	700.51	34,050	156	1	.....	157
Menhaden	20	641.52	23,110	163	.....	.....	163
Alewife	3	41.45	1,525	14	.....	.....	14
Clam	5	70.96	2,225	22	.....	.....	22
Scallop	2	26.12	650	8	.....	.....	8
Lobster	29	370.64	14,825	101	1	.....	102

In Table 32 the mackerel catch by fishing-grounds is given. It is interesting to observe that of the four vessels fishing for mackerel in the Gulf of St. Lawrence the average catch was only 1,250 pounds, while of the seventy-six on the New England and Nova Scotia shores the average yield was 9,715 pounds; the average stocks for the same vessels were $112 and $867, respectively.

32.—Table showing by fishing-grounds and apparatus the catch of the mackerel fleet of Maine in 1889.

Species.	New England shore.		Gulf of St. Lawrence.		Nova Scotia shore.		Total.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Mackerel caught with seines, fresh	33,500	$3,135	.....	.....	.....	.....	33,500	$3,135
Mackerel caught with seines, salted	471,400	44,271	5,000	$450	4,200	$441	480,600	45,162
Mackerel caught with nets, fresh	132,451	9,964	.....	.....	.....	.....	132,451	9,964
Mackerel caught with nets, salted	31,000	2,502	.....	.....	.....	.....	31,000	2,502
Mackerel caught with lines, fresh	15,300	1,373	.....	.....	.....	.....	15,300	1,373
Mackerel caught with lines, salted	50,500	4,240	.....	.....	.....	.....	50,500	4,240
Total	734,151	65,485	5,000	450	4,200	441	743,351	66,376

The shore fishery, as shown in Table 33, yields the largest quantities of fish and the greatest money returns. Of the 37,807,368 pounds, valued at $673,864, taken in the vessel fisheries of the State, 14,318,899 pounds, valued at $228,386, were obtained in the shore fishery, cod, hake, pollock, and haddock being the principal species. The cod vessels frequenting banks east of 65° west longitude brought in 6,275,907 pounds, valued at $190,423. After these, in the order of their importance, are the market, mackerel, herring, swordfish, menhaden, halibut, lobster, and molluscan fisheries.

33.—Table showing by fisheries and species the yield of the vessel fisheries of Maine in 1889.

Fisheries and species.	Pounds.	Value.
Banks east of 65° W. longitude:		
Cod, salted	6,275,907	$190,423
Halibut:		
Halibut, fresh	202,338	15,992
Shore:		
Alewives, fresh	28,000	195
Alewives, salted	14,000	161
Cod, fresh	1,979,954	38,761
Cod, salted	3,593,361	83,120
Cunners, fresh	60,000	1,200
Cusk, fresh	86,500	760
Cusk, salted	129,970	1,315
Eels, fresh	7,250	610
Haddock, fresh	1,092,950	19,500
Haddock, salted	737,534	8,531
Hake, fresh	699,752	6,023
Hake, salted	3,791,924	40,668
Halibut, fresh	113,415	7,221
Halibut, salted	600	36
Pollock, fresh	1,380,513	12,906
Pollock, salted	575,176	5,804
Shad, fresh	18,000	675
Smelt, fresh	10,000	900
Total	14,318,899	228,386
Mackerel:		
Mackerel, fresh	181,251	14,472
Mackerel, salted	562,100	51,904
Total	743,351	66,376
Market:		
Cod, fresh	1,710,616	$33,539
Cod, salted	92,288	1,995
Haddock, fresh	1,289,000	22,282
Halibut, fresh	23,700	1,678
Red snapper, fresh	285,000	7,100
Total	3,400,604	66,594
Menhaden:		
Menhaden, fresh	8,498,860	18,805
Herring:		
Herring, fresh	618,900	4,680
Herring, salted	2,497,200	34,827
Total	3,116,100	39,507
Swordfish:		
Swordfish, fresh	634,435	26,817
Molluscan:		
Scallops, fresh	32,614	1,950
Clams, fresh	35,020	1,582
Total	67,634	3,532
Crustacean:		
Lobsters, fresh	549,240	17,432
Grand total	37,807,368	673,864

THE SHORE FISHERIES.

Under this head are included all those fisheries prosecuted from boats or from the shore without the aid or use of vessels, although, as in the case of the lobster fishery, vessels may be employed to take the catch of the shore fishermen to market, in which case they are recorded as transporters.

The shore fisheries of Maine are of much greater consequence than those of any other New England State, and are more than double the importance of the vessel fisheries of the State, so far as the value of the products is concerned.

In the tables the extent of the industry is shown by counties and by apparatus, and some of the more important fisheries are discussed at length. In the first three tables the condensed figures for the shore fisheries are given for each county. The first tabular statement shows that of the total number of fishermen, viz, 6,205, Hancock County had 1,730, the greatest number, followed by Cumberland County with 1,105 and Washington County with 1,076. The other counties ranged from 744 in Lincoln to 43 in Penobscot.

Of the total sum invested in the shore fisheries, viz, $515,095, $237,469, or nearly half, represents boats, which are employed to the number of 5,990. In the number of boats Hancock County is first with 1,371, valued at $62,962, closely followed by Cumberland County with 1,232, worth $40,348, although in the item of value of boats Washington County ranks second, the 930 boats there used being worth $59,106. Penobscot County has only 24 boats, valued at $248.

Lobster pots are the most numerous form of apparatus of capture in the shore fisheries, and their aggregate value is far in excess of that of any other device. In 1889 they were used to the number of 121,250, the value of which was $108,812. Washington and Hancock counties had 65,861 pots, or considerably more than half. Knox, Lincoln, and Cumberland counties each had between 10,000 and 20,000 pots.

The next most valuable forms of apparatus are the weirs, of which 273, valued at $52,022, were operated in 1889. They are chiefly used in the capture of herring for smoking and canning, and are most numerous in the region east of the Penobscot River, especially in Washington County, which has more than half of the total number set in the State.

Trap nets rank next to weirs in value. They are chiefly used in the region west of and including the Penobscot River, in the counties of Hancock, Waldo and Sagadahoc. Salmon is the species for which they are principally set. The value of the trap nets operated in 1889 was $33,000.

Gill nets are important means of capture in all counties but Penobscot and Waldo. Over 3,500 were fished in 1889, the value of which was $32,973.

Pound nets are sparingly used in five counties, the greatest number being in Cumberland County. The total number set was 33, valued at $14,895, pound nets thus being relatively the most expensive form of apparatus in the shore fisheries of Maine.

Nearly equal in point of value to pound nets are the hand lines and trawl lines, worth $14,790. These are extensively used in all counties but Penobscot and Waldo, which have no ocean frontage and are therefore not interested in the line fisheries for ground fish which the position of the other counties makes important.

The only other forms of apparatus deserving special mention are bag nets and seines. The former are used to the number of 280, chiefly in the eastern counties; their total value is $11,570. Seines are most extensively employed in Hancock and Cumberland counties, which have 70 of the 75 seines fished in the State, Lincoln County having only 5 and none of the other counties having any.

Considering the aggregate investment by counties, it is seen that Hancock County takes the first position with $141,031, after which come Washington County with $113,987, Cumberland County with $69,626, and Knox County with $50,113. Sagadahoc, York, and Lincoln counties have from $34,000 to $45,000 each; Waldo County has only $16,382 and Penobscot County only $1,658.

The table of products shows 91,201,034 pounds of fish, mollusks, crustaceans, etc., taken in the shore fisheries of Maine in 1889; these were worth, at first hands, $1,420,239. Hancock County is considerably in advance of any other county in both the quantity and value of products, the figures being 27,017,744 pounds, valued at $428,711, of which 8,374,771 pounds, with a value of $197,089, represent lobsters. Second in rank is Washington County, with 21,148,162 pounds, worth $275,981; here the most important species is herring, of which 9,118,550 pounds, valued at $116,159, were taken, followed by lobsters, the catch of which was 7,251,790 pounds, for which the

fishermen received $109,084. Cumberland County comes after Washington County, showing a catch of 12,996,601 pounds, worth $230,770; in this county clams take precedence in quantity and value, 3,518,069 pounds being the output in 1889, worth to the fishermen $84,296. In Knox County, with its quota of 10,411,260 pounds, valued at $154,429, lobsters are by far the most important product, the yield of that species being 3,779,800 pounds, with a value of $105,108. The only remaining county with an output worth over $100,000 is Lincoln, in which 8,875,934 pounds of fishery products were secured, which yielded $132,286; in this county the lobster is also the most important single product, 1,693,250 pounds, valued at $52,138, being taken. The other counties, in the order of their rank, are York with products worth $84,161; Sagadahoc with $69,393; Waldo with $41,800 and Penobscot with the small sum of $2,708.

34.—Table showing by counties the number of persons engaged in the shore fisheries of Maine in 1889.

Counties.	No.
Washington	1,076
Hancock	1,730
Penobscot	43
Waldo	207
Knox	491
Lincoln	744
Sagadahoc	536
Cumberland	1,105
York	273
Total	6,205

35.—Table showing by counties the apparatus employed in the shore fisheries of Maine in 1889.

Designation.	Washington.		Hancock.		Penobscot.		Waldo.		Knox.	
	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.
Boats	930	$59,106	1,371	$62,962	24	$248	236	$4,053	616	$20,782
Weirs	173	29,947	43	11,130	.....	.....	3	120	28	8,767
Pound nets	.....	.....	3	1,000	.....	.....	.....	.....	.....	.....
Trap nets	4	375	126	10,505	2	115	114	8,135	6	220
Bag nets	98	2,570	67	3,630	25	1,125	53	2,550	3	125
Gill nets	172	1,684	318	3,235	19	152	.....	.....	210	1,890
Fyke nets	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seines	.....	.....	48	3,025	.....	.....	.....	.....	.....	.....
Lines	.....	731	.....	2,070	.....	.....	.....	11	.....	1,623
Pots	21,714	19,288	44,147	41,753	15	11	1,856	1,484	19,215	16,566
Spears	6	6	122	127	5	7	.....	.....	.....	.....
Scallop dredges	.....	.....	82	1,070	.....	.....	.....	.....	.....	.....
Clamming apparatus	.....	103	.....	494	.....	.....	.....	29	.....	90
Miscellaneous nets	64	177	22	30	.....	.....	.....	.....	8	50
Total	.....	113,987	.....	141,031	.....	1,658	.....	16,382	.....	50,113

Designation.	Lincoln.		Sagadahoc.		Cumberland.		York.		Total.	
	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.
Boats	464	$22,382	361	$9,048	1,232	$40,348	756	$18,540	5,990	$237,469
Weirs	13	238	.....	.....	13	1,820	.....	.....	273	52,022
Pound nets	1	300	4	4,200	20	6,495	5	2,900	33	14,895
Trap nets	.....	.....	89	13,650	.....	.....	.....	.....	341	33,000
Bag nets	.....	.....	34	1,570	.....	.....	.....	.....	280	11,570
Gill nets	708	5,351	234	2,895	711	6,071	1,189	11,695	3,561	32,973
Fyke nets	31	75	2	50	101	425	.....	.....	134	550
Seines	5	150	.....	.....	22	2,150	.....	.....	75	5,325
Lines	.....	3,523	.....	459	.....	3,720	.....	2,653	.....	14,790
Pots	12,875	11,937	2,565	2,051	10,394	8,099	8,470	7,623	121,250	108,812
Spears	25	25	.....	.....	.....	.....	.....	.....	158	165
Scallop dredges	36	468	5	65	.....	.....	.....	.....	123	1,603
Clamming apparatus	.....	63	.....	142	.....	498	.....	165	.....	1,584
Miscellaneous nets	13	80	.....	.....	.....	.....	.....	.....	107	337
Total	.....	44,592	.....	34,130	.....	69,626	.....	43,576	.....	515,095

36.—Table showing by counties and species the yield of the shore fisheries of Maine in 1889.

Species.	Washington.		Hancock.		Penobscot.		Waldo.		Knox.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Alewives, fresh	29,500	$185	36,290	$532			92,865	$480	384,250	$1,537
Alewives, salted	248,600	4,326	29,240	485			340	7		
Alewives, smoked	17,800	550	226,324	5,432			18,465	564	77,500	1,550
Cod, fresh	48,770	1,033	256,882	5,445					185,750	3,937
Cod, salted	303,210	7,741	913,921	23,334			2,000	51	124,771	3,211
Cusk, fresh			1,600	22						
Cusk, salted			17,959	182						
Eels, fresh	1,000	95	70,325	6,296	3,500	$250				
Flounders, fresh			666,275	14,009			1,200	36		
Frostfish, fresh	52,750	1,951	150,550	207	50,000	450	75,250	548		
Haddock, fresh	95,948	1,630	138,511	2,354			2,000	33	296,000	5,049
Haddock, salted	162,905	2,443	427,898	6,417					104,669	1,569
Hake, fresh	35,420	206	237,466	2,255			4,000	60	258,000	2,551
Hake, salted	307,650	4,614	726,738	10,900					80,239	1,206
Halibut, fresh	59,480	4,114	66,080	4,569						
Herring, fresh	6,106,625	19,333	6,451,556	24,234					3,026,250	11,662
Herring, salted	35,000	3,900	306,325	4,307					246,000	3,300
Herring, smoked	2,976,925	92,926	196,500	6,338					12,500	375
Menhaden, fresh			4,800	13						
Pollock, fresh	95,003	372	23,600	246					30,400	314
Pollock, salted	119,991	1,250	206,755	2,160			800	8		
Salmon, fresh	2,195	295	65,590	15,554	2,183	990	70,849	14,659	3,700	840
Shad, fresh	20,000	741	2,000	107			80	3		
Smelt, fresh	97,650	6,071	291,269	24,445	12,730	1,018	84,136	6,753	5,000	500
Waste fish, fresh	29,400	38					140,000	262		
Lobsters, fresh	7,251,790	109,084	8,374,771	197,089			317,000	11,552	3,779,800	105,108
Clams (soft), fresh	66,965	2,609	332,078	13,770			147,700	6,751	100,000	3,000
Clams (soft), salted	437,060	7,358	2,214,040	41,191			1,600	30	220,000	7,280
Scallops, fresh			177,660	11,972						
Algæ	2,500,000	1,250	4,300,000	2,015					1,450,000	725
Sounds	9,323	233	22,022	551			121	3	2,431	61
Tongues	2,030	41	6,092	122					832	17
Oil	35,232	1,592	76,627	2,158					23,168	637
Total	21,148,162	275,981	27,017,744	428,711	68,413	2,708	958,406	41,800	10,411,260	154,429

Species.	Lincoln.		Sagadahoc.		Cumberland.		York.		Total for the State.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Alewives, fresh	766,675	$6,592	274,100	$1,902	776,545	$1,730			2,360,225	$12,958
Alewives, salted	320,000	3,680							598,180	8,498
Alewives, smoked	17,625	500							357,714	8,596
Bream, fresh			26,000	270					26,000	270
Butter-fish, fresh					18,000	300	9,000	$145	27,000	445
Catfish, fresh			6,000	120					6,000	120
Cod, fresh	576,000	12,211	65,000	1,378	565,000	11,988	664,500	14,513	2,361,902	50,505
Cod, salted	176,780	4,516							1,520,682	38,853
Cunners, fresh			16,000	585	25,300	785	2,800	53	44,100	1,423
Cusk, fresh	73,500	1,015	25,000	344	165,000	2,280	16,000	220	281,100	3,881
Cusk, salted	5,600	58							23,559	240
Eels, fresh	9,570	764	2,000	140	8,000	480	1,500	100	95,895	8,125
Flounders, fresh	25,000	230			92,000	1,210	45,000	330	829,475	15,815
Frostfish, fresh			20,000	80					348,550	3,236
Haddock, fresh	53,800	914	36,000	612	1,007,500	17,127	759,000	12,903	2,386,759	40,589
Haddock, salted	85,120	1,276							782,592	11,738
Hake, fresh	542,500	5,253			968,000	9,299	175,000	1,668	2,216,386	21,232
Hake, salted	297,920	4,468							1,416,547	21,248
Halibut, fresh	7,550	520			19,000	1,311	7,800	550	159,910	11,064
Herring, fresh	326,000	2,045	200,000	1,600	1,011,500	10,920	228,400	1,785	17,350,331	71,579
Herring, salted	1,667,000	12,715					458,400	4,624	2,712,725	28,846
Herring, smoked									3,185,925	99,639
Mackerel, fresh			100,000	9,880	74,160	5,228	62,030	6,494	236,190	21,602
Menhaden, fresh			50,000	150	1,372,500	7,230	258,600	2,086	1,685,900	9,479
Pollock, fresh	49,700	497	160,000	1,820	592,300	6,340	7,000	80	958,003	9,669
Pollock, salted	56,000	582							383,546	4,000
Salmon, fresh			5,683	1,225	2,240	500	300	55	152,740	34,118
Shad, fresh			738,583	14,451	108,137	2,660	1,000	50	869,800	18,012
Smelt, fresh	77,600	7,170	248,500	14,590	196,500	10,630	32,000	2,900	1,045,385	74,077
Waste fish, fresh					279,000	1,455			448,400	1,755
Lobsters, fresh	1,693,250	52,138	270,500	8,410	2,143,600	53,507	621,400	19,845	24,452,111	556,733
Clams (soft), fresh	92,580	3,388	59,460	1,846	1,040,009	29,869	368,280	11,126	2,207,072	72,359
Clams (soft), salted	217,400	4,725	509,000	9,620	2,478,060	54,427	104,500	2,189	6,181,600	126,820
Scallops, fresh	78,650	4,420	6,375	305					262,685	16,607
Quahogs, fresh							800	100	800	100
Algæ	1,600,000	800					3,050,000	1,525	12,900,000	6,315
Sounds	9,028	226							42,925	1,074
Tongues	1,184	23							10,138	203
Oil	49,902	1,560	2,325	65	54,250	1,494	29,678	820	272,182	8,326
Total	8,875,934	132,286	2,820,526	69,393	12,996,601	230,770	6,902,988	84,161	91,201,034	1,420,239

The most important shore fisheries in Maine are those for lobsters, herring, clams, ground fish, smelt, salmon, and shad. Each of these requires a short notice.

The lobster.—In considering the quantities of the different species making up the aggregate catch in the shore fisheries of Maine, the prominent place occupied by the lobster is clearly shown. The lobster fishery is the most important one in which the citizens of Maine are employed. More people are engaged in the capture of lobsters than of any other single product, and the value of the output in 1889 was more than one-fourth that of the entire yield of the fisheries of the State, being $574,165. As compared with 1880, the lobster catch has greatly increased, and the fishery is becoming more important each year, this being evidenced as much by the increasing attention bestowed on the subject of lobster protection and preservation by the State authorities as by the larger output. Statistics of the fishery for the four years, 1880, 1887, 1888, and 1889, are here presented side by side for comparison. It is thought that the catch in the last-named year was the largest in the history of the State.

Years.	Pounds.	Value.
1880	14,234,182	$344,693
1887	22,916,642	512,044
1888	21,694,731	515,880
1889	25,001,351	574,165

The comparatively small quantities of lobsters taken in the vessel fishery are included in the table in order to make the comparison more complete, there being no separate figures for the shore catch in 1880.

The herring.—The herring is the most important species in the shore fisheries of the State, with the exception of the lobster; in the vessel fisheries the cod has greater value; but if the canning industry and trade in smoked fish are taken into consideration the herring easily assumes the first place among the products of the Maine fisheries, and the species is by far the most abundant commercial fish in the waters of the State. In 1889, 23,248,981 pounds were sold fresh, salted, and smoked, for which the fishermen received $200,064, these figures being in addition to the vessel catch already referred to.

Since 1885 the herring fishery of Maine has undergone a noticeable increase, which has been chiefly due to the abrogation of the Washington treaty. The manufacturing enterprises connected with the canning of lobsters, the canning and smoking of herring, etc., have steadily increased, and new life and new capital have been put into the industry to meet the demand for larger supplies of raw materials, among which herring rank first in quantity and importance. The increase in the number of weirs and other appliances of capture has been more marked each year, and the growth and extension westward of the fishery and the dependent shore industries has been one of the most noteworthy features of the fisheries of this State during the past decade.

An increase in the herring weir fisheries has in most localities been attended with a corresponding increase in the smoked-herring business, but in the region of Mount Desert Island a most interesting and important exception to this rule is to be observed, due to its favorable location as a baiting rendezvous for the bank cod fishermen of both Maine and Massachusetts. In this vicinity the increase in the number of herring

weirs has had no appreciable effect on the smoking of herring, the smokehouses being more neglected than ever before. This condition is due to the circumstance that herring can be sold fresh for bait at better prices than would result from smoking them. The demand for bait in this section is now so constant and so great that the weir fishermen have not been able to meet it, and an extensive herring fishery with gill nets has been inaugurated within the past three years to supplement the weir fishery. At the Cranberry Isles and also in the vicinity of Southwest Harbor and Bar Harbor large numbers of bank and shore vessels are baited each year, and the practice of taking bait in this vicinity is annually becoming more popular and of increasing importance to the deep-sea fisheries. Prior to the building of weirs there was little or no baiting done here, and vessels were obliged to resort to more distant places and often had to go to the provinces at great loss of time.

The marked effect which the expiration of the reciprocity treaty with Canada has had on the development of the fisheries and fishery industries of the entire eastern coast of Maine has been nowhere more noticeable than in the increased facilities afforded American vessels to procure an abundant supply of bait in home ports through the building of brush weirs.

The soft clam.—This important species ranks third in value in the shore fisheries of Maine, being surpassed by the herring by only a few hundred dollars. In the table the yield of fresh clams is given at 2,207,072 pounds, valued at $72,359; these figures include the clams sold fresh for food, and also those which are subsequently canned. Much the larger part of the clam product is salted by the fishermen to be used as bait in the line fisheries. As shown by the table, 6,181,600 pounds of clam meats were thus prepared, for which the fishermen obtained $126,820. The value of salt clams as bait makes this fishery one of the most important in the State. The output in 1889 represented 30,908 barrels of salt bait, with an average value of $4.10 per barrel.

The cod, haddock, hake, and other ground fish.—The catch of the species commonly designated "ground fish," including cod, cusk, haddock, hake, halibut, and pollock, will, if taken in the aggregate, have a value somewhat greater than the herring, although no three of these species together yield the fishermen so much as the last-named fish. Among the ground fish taken in the shore fisheries the cod ranks first, with 3,882,584 pounds of fresh and salted fish, worth, at first hands, $89,358. Haddock come next in value, with $52,327, though the quantity of fresh and salted haddock sold, viz, 3,169,351 pounds, is less than the catch of hake, which amounted to 3,632,933 pounds, but sold for only $42,480. The yield of pollock was 1,341,549 pounds, with a value of $13,669, followed by the halibut with 159,910 pounds, all of which was sold fresh for $11,064, and the cusk with 304,659 pounds, valued at $4,121.

The smelt.—One of the most important food species occurring in the coast rivers of Maine is the smelt, a fish whose value to the State is second only to that of the lobster, herring, clam, and cod. It is by far the most important river fish in Maine, easily surpassing in economic value the salmon, shad, alewife, and other species that enter fresh water. The quantity taken in 1889 was 1,045,385 pounds, worth $74,077, or an average of over 7 cents per pound. The specially important rivers in which smelt are taken are the Bagaduce, Penobscot, and Kennebec.

The salmon.—This, the most highly esteemed of the food-fishes of Maine, is chiefly abundant in the Penobscot River, in which more than seven-eighths of the yield is taken. Practically, the entire catch is obtained in weirs and trap nets. The preservation of the salmon in the State is largely dependent on the artificial stocking of the streams by the introduction of fry hatched at the Government stations on the Penobscot. The catch varies considerably from year to year, and in 1889 was less than in the two preceding years, being 152,740 pounds, against 185,637 pounds in 1887 and 205,149 pounds in 1888. The yield in 1889 was worth $34,118, giving the fish an average value of 29 cents a pound.

The shad.—The catch of shad in Maine waters is now greater than in any other New England State, although in 1880 the output of the Connecticut fishery was more than double that of Maine. The fishery has undergone a considerable advance since 1880 and is no doubt still capable of great development. Almost the entire yield is taken west of the Penobscot River in trap nets and gill nets. Occasionally large schools of shad are seen in the open sea off the Maine coast, and mackerel vessels have at times made good catches in purse seines, although this fishery is necessarily uncertain. The quantity of shad taken in this State in 1889 is shown in the following table, to which the years 1880, 1887, and 1888 are added for comparison. The productiveness of each form of apparatus is given for the three more recent years. The fish credited to purse seines were of course caught by vessels and are added to make the subject complete and to afford a basis for comparison with 1880, for which year no separate figures for the shore and vessel fisheries are available.

Apparatus.	1889.		1888.		1887.		1880.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Brush weirs	6,360	$286	5,800	$273	5,700	$270	.....	.....
Pound nets	9,000	250	15,000	550	10,000	250	.....	.....
Trap nets	553,640	10,368	508,184	14,585	544,000	13,514	.....	.....
Gill nets	300,800	7,108	278,272	7,460	528,020	12,976	.....	.....
Purse seines	18,000	675	*32,000	1,500	*8,000	320	.....	.....
Total	887,800	18,687	839,256	24,368	1,095,720	27,330	580,319	$11,876

*Salted.

The following table gives, by counties and species, the quantity and value of fish taken in each form of apparatus; the invertebrates, secondary products, etc., are also added to make the presentation complete for each county. It appears that while of the fish proper the pound nets, weirs, and trap nets take by far the larger quantity, the hand lines and trawl lines yield a greater revenue. The catch in pots surpasses in value that of the lines, pound nets, weirs, etc., combined, although the quantity of fish so taken is insignificant. Examination of the table will give a comprehensive idea of the actual and relative importance of the different devices in each county.

37.—Table showing by counties and apparatus the yield of the shore fisheries of Maine in 1889.

Apparatus and species.	Washington.		Hancock.		Penobscot.		Waldo.		Knox.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Haul seines:										
Flounders, fresh			463,400	$9,135						
Smelt, fresh			53,750	5,000						
Total			517,150	14,135						
Gill nets.										
Herring, fresh	175,100	$1,475	302,207	1,296					202,500	$3,000
Herring, salted	35,000	3,000	306,325	4,307					246,000	3,300
Herring, smoked	8,000	160	3,000	120					12,500	375
Menhaden, fresh			4,800	13						
Salmon, fresh	152	25			1,853	$887				
Shad, fresh	6,000	300								
Total	224,252	5,860	616,332	5,736	1,853	887			461,000	6,675
Pound nets, weirs, and traps:										
Alewives, fresh	7,000	35	36,290	532			92,865	$480		
Alewives, salted	6,000	90	26,540	445			340	7		
Alewives, smoked			219,574	5,252			18,465	564		
Herring, fresh	5,931,525	17,858	6,149,349	22,938					2,823,750	8,062
Herring, smoked	2,968,925	92,766	193,500	6,218						
Pollock, fresh	73,500	147								
Salmon, fresh	2,043	270	65,590	15,554	330	103	70,849	14,659	3,700	840
Shad, fresh	14,000	441	2,000	107			80	3		
Smelt, fresh	33,790	859	2,275	220			1,100	110	4,000	400
Waste fish, fresh	29,400	38								
Total	9,066,183	112,504	6,695,118	51,266	330	103	183,699	15,823	2,831,450	9,902
Bag nets and dip nets:										
Alewives, fresh	22,500	150							384,250	1,537
Alewives, salted	242,600	4,236	2,700	40						
Alewives, smoked	17,800	550	6,750	180					77,500	1,550
Flounders, fresh			26,450	765			1,200	36		
Frostfish or tomcod, fresh	52,750	1,951	150,550	207	50,000	450	75,250	548		
Smelt, fresh	63,860	5,212	84,357	6,616	12,730	1,018	78,036	6,243	1,000	100
Waste fish, fresh							140,000	262		
Total	399,510	12,099	270,807	7,808	62,730	1,468	294,486	7,089	462,750	3,187
Hand lines and trawl lines:										
Cod, fresh	48,770	1,033	256,882	5,445					185,750	3,937
Cod, salted	303,210	7,741	913,921	23,334			2,000	51	124,771	3,211
Cusk, fresh			1,600	22						
Cusk, salted			17,959	182						
Hake, fresh	35,420	206	237,466	2,255			4,000	60	258,000	2,551
Hake, salted	307,650	4,614	726,738	10,900					80,239	1,206
Halibut, fresh	59,480	4,114	66,080	4,569						
Haddock, fresh	95,948	1,630	138,511	2,354			2,000	33	296,000	5,049
Haddock, salted	162,905	2,443	427,898	6,417					104,669	1,569
Pollock, fresh	21,503	225	23,600	246					30,400	314
Pollock, salted	119,991	1,250	206,755	2,160			800	8		
Smelt, fresh			150,887	12,609			5,000	400		
Total	1,154,877	23,256	3,168,297	70,493			13,800	552	1,079,829	17,837
Pots:										
Eels, fresh	1,000	95	70,325	6,296	3,500	250				
Lobsters, fresh	7,251,790	109,084	8,374,771	197,089			317,000	11,552	3,779,800	105,108
Total	7,252,790	109,179	8,445,096	203,385	3,500	250	317,000	11,552	3,779,800	105,108
Spears:										
Flounders, fresh			176,425	4,109						
Miscellaneous:										
Clams (soft), fresh	66,965	2,609	332,078	13,770			147,700	6,751	100,000	3,000
Clams (soft), salted	437,000	7,358	2,214,040	41,191			1,600	30	220,000	7,280
Scallops, fresh			177,660	11,972						
Algæ	2,500,000	1,250	4,300,000	2,015					1,450,000	725
Total	3,003,965	11,217	7,023,778	68,948			149,300	6,781	1,770,000	11,005
Secondary products:										
Sounds	9,323	233	22,022	551			121	3	2,431	61
Tongues	2,030	41	6,092	122					832	17
Oil (fish and porpoise)	35,232	1,592	76,627	2,158					23,168	637
Total	46,585	1,866	104,741	2,831			121	3	26,431	715
Grand total	21,148,162	275,981	27,017,744	428,711	68,413	2,708	958,406	41,800	10,411,260	154,429

37.—Table showing by counties and apparatus the yield of the shore fisheries of Maine in 1889—Continued.

Apparatus and species.	Lincoln.		Sagadahoc.		Cumberland.		York.		Total for State.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Haul seines:										
Flounders, fresh									463,400	$9,135
Smelt, fresh	9,000	$700			107,500	$5,180			170,250	10,880
Waste fish, fresh					99,000	505			99,000	505
Total	9,000	700			206,500	5,685			732,650	20,520
Gill nets:										
Cod, fresh							120,000	$2,950	120,000	2,950
Herring, fresh	306,000	1,910			460,000	6,770	3,400	25	1,449,207	14,476
Herring, salted	1,667,000	12,715					458,400	4,624	2,712,725	28,846
Herring, smoked									23,500	655
Mackerel, fresh			4,500	$500			21,520	2,413	26,020	2,913
Menhaden, fresh			50,000	150	1,372,500	7,230	155,600	1,120	1,582,900	8,513
Salmon, fresh									2,005	912
Shad, fresh			186,663	4,148	108,137	2,660			300,800	7,108
Total	1,973,000	14,625	241,163	4,798	1,940,637	16,660	758,920	11,132	6,217,157	66,373
Pound nets, weirs, and trap nets:										
Alewives, fresh			274,100	1,902	776,545	1,730			1,186,800	4,679
Alewives, salted									32,880	542
Alewives, smoked									238,039	5,816
Butter-fish, fresh					18,000	300	9,000	145	27,000	445
Cod, fresh							8,500	190	8,500	190
Cunners, fresh					22,000	660	2,800	53	24,800	713
Flounders, fresh							5,000	75	5,000	75
Herring, fresh	20,000	135	200,000	1,600	551,500	4,150	225,000	1,760	15,901,124	57,103
Herring, smoked									3,162,425	98,984
Mackerel, fresh			81,000	7,980	51,660	3,238	16,510	1,761	149,170	12,979
Menhaden, fresh							103,000	966	103,000	966
Pollock, fresh									73,500	147
Salmon, fresh			5,683	1,225	2,240	500	300	55	150,735	33,206
Shad, fresh			551,920	10,303			1,000	50	569,000	10,904
Smelt, fresh			4,000	200	35,000	1,800			80,165	3,589
Waste fish, fresh					180,000	950			209,400	988
Total	20,000	135	1,116,703	23,210	1,636,945	13,328	371,110	5,055	21,921,538	231,326
Fyke nets:										
Flounders, fresh	25,000	230			82,000	1,050			107,000	1,280
Frostfish, fresh			2,500	10					2,500	10
Smelt, fresh			1,500	90					1,500	90
Total	25,000	230	4,000	100	82,000	1,050			111,000	1,380
Bag nets and dip nets:										
Alewives, fresh	766,675	6,592							1,173,425	8,279
Alewives, salted	320,000	3,680							565,300	7,956
Alewives, smoked	17,625	500							119,675	2,780
Flounders, fresh									27,650	801
Frostfish, fresh			17,500	70					346,050	3,226
Smelt, fresh			23,000	1,300	13,000	800			275,983	21,289
Waste fish, fresh									140,000	262
Total	1,104,300	10,772	40,500	1,370	13,000	800			2,648,083	44,593
Hand and trawl lines:										
Bream, fresh			26,000	270					26,000	270
Catfish, fresh			6,000	120					6,000	120
Cod, fresh	576,000	12,211	65,000	1,378	565,000	11,988	536,000	11,373	2,233,402	47,365
Cod, salted	176,780	4,516							1,520,682	38,853
Cunners, fresh			16,000	585	3,300	125			19,300	710
Cusk, fresh	73,500	1,015	25,000	344	165,000	2,280	16,000	220	281,100	3,881
Cusk, salted	5,600	58							23,559	240
Flounders, fresh					10,000	160			10,000	160
Hake, fresh	542,500	5,253			968,000	9,299	175,000	1,668	2,216,386	21,252
Hake, salted	297,920	4,468							1,416,547	21,248
Halibut, fresh	7,550	520			19,000	1,311	7,800	550	159,910	11,064
Haddock, fresh	53,800	914	36,000	612	1,007,500	17,127	759,000	12,903	2,386,759	40,589
Haddock, salted	85,120	1,276							782,592	11,738
Mackerel, fresh			14,500	1,400	22,500	1,990	24,000	2,320	61,000	5,710
Pollock, fresh	49,700	497	160,000	1,820	592,300	6,340	7,000	80	884,503	9,522
Pollock, salted	56,000	582							383,546	4,000
Smelt, fresh	68,600	6,470	220,000	13,000	41,000	2,850	32,000	2,900	517,487	38,229
Total	1,993,070	37,780	568,500	19,529	3,393,600	53,470	1,556,800	32,014	12,928,773	254,931

37.—Table showing by counties and apparatus the yield of the shore fisheries of Maine in 1889—Continued.

Apparatus and species.	Lincoln.		Sagadahoc.		Cumberland.		York.		Total for State.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Pots:										
Eels, fresh									74,825	$6,641
Lobsters, fresh	1,693,250	$52,138	270,500	$8,410	2,143,600	$53,507	621,400	$19,845	24,452,111	556,733
Total	1,693,250	52,138	270,500	8,410	2,143,600	53,507	621,400	19,845	24,526,936	563,374
Spears:										
Eels, fresh	9,570	764	2,000	140	8,000	480	1,500	100	21,070	1,484
Flounders, fresh							40,000	255	216,425	4,364
Total	9,570	764	2,000	140	8,000	480	41,500	355	237,495	5,848
Miscellaneous:										
Clams (soft), fresh	92,580	3,388	59,460	1,846	1,040,009	29,869	368,280	11,126	2,207,072	72,359
Clams (soft), salted	217,400	4,725	509,000	9,620	2,478,060	54,427	104,500	2,189	6,181,600	126,820
Scallops, fresh	78,650	4,420	6,375	305					262,685	16,697
Quahogs, fresh							800	100	800	100
Algæ	1,600,000	800					3,050,000	1,525	12,900,000	6,315
Total	1,988,630	13,333	574,835	11,771	3,518,069	84,296	3,523,580	14,940	21,552,157	222,291
Secondary products:										
Sounds	9,028	226							42,925	1,074
Tongues	1,184	23							10,138	203
Oil	49,902	1,560	2,325	65	54,250	1,494	29,678	820	272,182	8,326
Total	60,114	1,809	2,325	65	54,250	1,494	29,678	820	325,245	9,603
Grand total	8,875,934	132,286	2,820,526	69,393	12,996,601	230,770	6,902,988	84,161	91,201,034	1,420,239

In the following table, based on the preceding, the wide difference in the various forms of apparatus is shown, and the disparity between the relative quantity and value of products taken in each is well exhibited. The percentage of the quantity and value of the catch in the various forms of apparatus is compared with the total yield.

38.—Table showing the relative quantity and value of yield in each principal form of apparatus of capture employed in the shore fisheries of Maine in 1889.

Apparatus.	Percentage.	
	Quantity.	Value.
Haul seines	.81	1.46
Weirs, pound nets, and trap nets	24.12	16.40
Gill nets	6.84	4.71
Fyke nets	.12	.09
Bag nets and dip nets	2.91	3.16
Hand lines and trawl lines	14.23	18.07
Pots	26.99	39.94
Spears	.26	.41
Miscellaneous	23.72	15.76
Total	100.00	100.00

From Table 39, showing certain averages and percentages, it is seen that in Penobscot County for each $100 invested in boats the fishermen take products to the value of $1,354, this being considerably more than the average for any other county, although Waldo County shows $1,020. The average value of catch per each $100 invested in apparatus is greatest in Cumberland County, being $788; after which come Lincoln, Hancock, Knox, and Washington, with over $500 each. The average catch per man is greatest in Knox County, which shows $315, against $308 in York County and $256 in Washington County. In the same table the percentage of value of yield in the principal forms of apparatus is given by counties. In Washington County it will be observed that 41 per cent of the total value of the shore fisheries is taken in pound

nets, trap nets, and weirs, and 40 per cent in pots, while only 2 per cent is taken by means of gill nets. In Hancock, Knox, and Lincoln counties pots also take by far the largest percentage of the catch. In Penobscot County seines and bag nets yield 54 per cent and gill nets 33 per cent, the relative importance of these forms of apparatus being much greater in this county than elsewhere in the State. Lines are the most important means of capture in York County, and such miscellaneous devices as rakes, hoes, dredges, etc., are most important in Cumberland County.

39.—Table showing by counties certain averages and percentages of the shore fisheries of Maine in 1889.

Counties.	Value of catch per each $100 invested in boats.	Value of catch per each $100 invested in apparatus.	Value of catch per each man employed.	Percentage of value of yield in principal forms of apparatus.								
				Total.	Pound nets, trap nets, and weirs.	Seines and bag nets.	Gill nets.	Fyke nets.	Lines.	Pots.	Spears.	Miscellaneous.
Washington	$467	$503	$256	100.00	40.76	4.38	2.12	.....	8.44	39.56	.....	4.74
Hancock	680	549	248	100.00	11.96	5.11	1.34	.....	16.45	47.44	.95	16.75
Penobscot	1,354	193	63	100.00	3.80	54.21	32.76	.....	.....	9.23	.....	.....
Waldo	1,020	339	202	100.00	37.85	16.96	.....	.....	1.32	27.64	.....	16.23
Knox	742	527	315	100.00	6.41	2.07	4.32	.....	11.55	68.06	.....	7.59
Lincoln	591	596	178	100.00	.10	8.67	11.06	.17	28.56	39.41	.58	11.45
Sagadahoc	771	276	129	100.00	33.45	1.98	6.92	.14	28.14	12.12	.20	17.05
Cumberland	573	788	209	100.00	5.78	2.81	.22	.45	23.17	23.19	.21	37.17
York	455	337	308	100.00	6.01	.....	13.23	.....	38.04	23.58	.42	18.72

The following table shows for each county the percentage of the value of each species to the value of the total yield in the county and illustrates the great differences which exist in the various counties in the matter of the importance of fish and other products therein taken:

40.—Table showing by counties the percentage of the value of each species to the total yield of the shore fisheries of Maine in 1889.

Species.	Washington.	Hancock.	Penobscot.	Waldo.	Knox.	Lincoln.	Sagadahoc.	Cumberland.	York.
Alewives, fresh	.07	.12	.....	1.15	1.00	5.05	2.74	.75	.....
Alewives, salted	1.58	.11	.....	.02	.....	2.82	.....	.....	.....
Alewives, smoked	.20	1.28	.....	1.35	1.61	.38	.....	.....	.....
Bream, fresh	.....	.....	.....	.....	.....	.....	.39	.....	.....
Butter-fish, fresh	.....	.....	.....	.....	.....	.....	.....	.13	.17
Catfish, fresh	.....	.....	.....	.....	.....	.....	.17	.....	.....
Cod, fresh	.38	1.28	.....	.....	2.56	9.36	1.99	5.23	17.42
Cod, salted	2.82	5.48	.....	.12	2.09	3.46	.....	.....	.....
Cunners, fresh	.....	.....	.....	.....	.....	.....	.84	.34	.06
Cusk, fresh	.....	.01	.....	.....	.....	.78	.50	.99	.26
Cusk, salted	.....	.04	.....	.....	.....	.04	.....	.....	.....
Eels, fresh	.03	1.48	9.23	.....	.....	.59	.20	.21	.12
Flounders, fresh	.....	3.29	.....	.09	.....	.18	.....	.53	.40
Frostfish or tomcod, fresh	.71	.05	16.62	1.31	.....	.....	.12	.....	.....
Haddock, fresh	.59	.55	.....	.08	3.28	.70	.88	7.47	15.48
Haddock, salted	.89	1.51	.....	.....	1.02	.98	.....	.....	.....
Hake, fresh	.08	.53	.....	.14	1.66	4.03	.....	4.06	2.00
Hake, salted	1.68	2.56	.....	.....	.78	3.42	.....	.....	.....
Halibut, fresh	1.50	1.07	.....	.....	.....	.40	.....	.57	.66
Herring, fresh	7.05	5.69	.....	.....	7.59	1.57	2.31	4.76	2.14
Herring, salted	1.42	1.01	.....	.....	2.15	9.74	.....	.....	5.55
Herring, smoked	33.90	1.49	.....	.....	.24	.....	.....	.....	.....
Mackerel, fresh	.....	.....	.....	.....	.....	.....	14.25	2.28	7.79
Menhaden, fresh	.....	.....	.....	.....	.....	.....	.22	3.15	2.50
Pollock, fresh	.14	.06	.....	.....	.20	.38	2.63	2.77	.10
Pollock, salted	.46	.51	.....	.02	.....	.45	.....	.....	.....
Salmon, fresh	.11	3.65	36.56	35.07	.55	.....	1.77	.22	.07
Shad, fresh	.27	.03	.....	.01	.....	.....	20.84	1.16	.06
Smelt, fresh	2.22	5.74	37.59	16.15	.33	5.49	21.04	4.64	3.48
Waste fish, fresh	.01	.....	.....	.63	.....	.....	.....	.63	.....
Lobsters, fresh	39.80	46.28	.....	27.64	68.38	39.96	12.13	23.34	23.81
Clams (soft), fresh	.95	3.23	.....	16.15	1.95	2.60	2.66	13.03	13.35
Clams (soft), salted	2.68	9.67	.....	.07	4.74	3.62	13.88	23.74	2.63
Scallops, fresh	.....	2.81	.....	.....	.....	3.39	.44	.....	.....
Quahogs, fresh	.....	.....	.....	.....	.....	.....	.....	.....	.12
Algæ	.46	.47	.....	.....	.47	.61	.....	.....	1.83
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

THE SHORE INDUSTRIES.

Some of the shore fishery industries of Maine are the most important of the kind in New England, and add greatly to the value of the fisheries proper, upon which they are dependent. The branches in which the State excels all others are sardine canning, lobster canning, clam canning, and herring smoking; in addition to which the menhaden industry, preparation of finnan haddies, etc., are of considerable importance.

The canning industry.—This is the most important shore business connected with the fisheries of Maine. The different branches of the industry include the canning of sardines, menhaden, plain herring, clams, and lobsters, and mackerel when that species is obtainable. Connected with the canning business is an extensive smoked-herring trade, which is confined to Washington and Hancock counties, and is incidental to sardine canning. The full extent of the entire industry can be readily judged from the appended tables, which show the various phases of the subject in great detail.

41.—Table showing by counties the products of the canning industry of Maine in 1889.

Products.	Washington.		Hancock.		Knox.		Lincoln.		Cumberland.	
	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.
I. Raw products:										
Herring.....pounds..	27,097,000	$77,885	3,881,000	$16,736	265,000	$1,178	35,888	$160	315,450	$2,130
Lobsters.....do....	2,451,303	30,988	1,073,323	13,258	1,772,620	22,158	455,408	5,688	.....	.....
Clams.....bushels..	.....	.....	3,011	753	10,400	2,600	4,600	1,150	12,200	3,600
Menhaden.....pounds..	.....	.....	.....	.....	881,550	2,939	.....	.....	.....	.....
Total	.....	108,873	.....	30,747	.....	28,875	.....	6,998	.....	5,730
II. Manufactured products:										
Sardines, in oil:										
Quarters .....cases..	250,957	971,204	9,683	37,473	1,300	5,200	.....	.....	.....	.....
Halves .....do....	9,881	56,716	.....	.....	.....	.....	.....	.....	.....	.....
Three-quarters..do....	1,025	4,100	.....	.....	.....	.....	.....	.....	.....	.....
Sardines, in mustard:										
Quarters .....cases..	3,127	15,635	1,000	5,000	.....	.....	.....	.....	.....	.....
Three-quarters..do....	130,096	455,336	27,973	97,906	.....	.....	.....	.....	.....	.....
Sardines, in spices:										
Quarters .....cases..	62	310	1,000	5,000	.....	.....	.....	.....	.....	.....
Three-quarters..do....	3,609	13,534	2,000	7,500	.....	.....	.....	.....	.....	.....
One pound .....do....	.....	.....	.....	.....	.....	.....	74	277	.....	.....
Two pound.....do....	.....	.....	.....	.....	.....	.....	10	26	.....	.....
Odd sizes.....do....	36	126	.....	.....	.....	.....	.....	.....	.....	.....
Sardines, in tomato sauce:										
One pound.....cases..	.....	.....	.....	.....	.....	.....	256	704	.....	.....
Two pound.....do....	.....	.....	.....	.....	.....	.....	23	58	.....	.....
"Brook trout" (herring):										
Three-pound ovals, cases	.....	.....	1,100	6,600	.....	.....	.....	.....	.....	.....
Plain herring:										
Three-quarters.cases..	643	1,608	.....	.....	.....	.....	.....	.....	.....	.....
One pound.....do....	1,812	5,074	2,200	6,160	.....	.....	76	227	2,297	6,715
Smoked herring:										
Regulars.....boxes..	261,480	40,931	32,000	4,999	.....	.....	.....	.....	.....	.....
Bloaters.....do....	13,241	10,361	.....	.....	.....	.....	.....	.....	.....	.....
Pickled herring...bbls...	616	2,464	400	1,600	.....	.....	.....	.....	.....	.....
Menhaden:										
One pound .....cans..	.....	.....	.....	.....	378,272	26,794	.....	.....	.....	.....
Russian sardines..bbls..	1,086	4,344	1,000	4,000	.....	.....	.....	.....	.....	.....
Anchovies.....do....	20	80	100	400	.....	.....	.....	.....	.....	.....
Lobsters:										
One pound .....cans..	470,348	58,794	253,601	31,700	198,621	25,659	76,951	10,424	.....	.....
Two pound.....do....	.....	.....	.....	.....	76,970	14,430	8,550	1,606	.....	.....
Clams:										
One pound .....do....	.....	.....	46,800	3,169	103,050	7,252	29,915	2,119	226,400	12,584
Two pound.....do....	.....	.....	.....	.....	18,500	1,739	9,492	889	.....	.....
Three pound ....do....	.....	.....	.....	.....	37,600	4,399	19,494	2,274	.....	.....
Clam juice.....do....	.....	.....	.....	.....	75,000	8,625	.....	.....	.....	.....
Total	.....	1,640,617	.....	211,507	.....	94,098	.....	18,604	.....	19,299
III. Secondary products:										
Oil .....gallons..	31,703	7,926	2,073	518	510	128	30	8	.....	.....
Herring pomace...tons..	1,668	13,344	240	1,920	20	160	13	104	.....	.....
Lobster pomace...do....	980	7,840	537	4,296	669	7,065	183	1,647	.....	.....
Total	.....	29,110	.....	6,734	.....	7,353	.....	1,759	.....	.....
Total of manuf'd and secondary products..	.....	1,669,727	.....	218,241	.....	101,451	.....	20,363	.....	19,299

41.—Table showing the products of the canning industry of Maine in 1889—Continued.

SUMMARY.

Products.	No.	Value.	Products.	No.	Value.
I. Raw products:			II. Manufactured products—cont'd.		
Herring ..... pounds..	31,594,338	$98,089	Smoked herring:		
Lobsters ..... do....	5,752,654	72,092	Regulars ..... boxes..	293,480	$45,930
Clams ..... bushels.	30,211	8,103	Bloaters ..... do....	13,241	10,361
Menhaden ..... pounds..	881,550	2,939	Pickled herring ..... barrels..	1,016	4,064
			Menhaden:		
Total	.....	181,223	One pound ..... cans..	378,272	26,794
			Russian sardines ..... barrels..	2,086	8,344
II. Manufactured products:			Anchovies ..... do....	120	480
Sardines, in oil:			Lobsters:		
Quarters ..... cases..	261,940	1,013,877	One pound ..... cans..	999,521	126,577
Halves ..... do....	9,881	56,716	Two pound ..... do....	85,520	16,036
Three-quarters ..... do....	1,025	4,100	Clams:		
Sardines, in mustard:			One pound ..... do....	406,165	25,124
Quarters ..... do....	4,127	20,635	Two pound ..... do....	27,992	2,628
Three-quarters ..... do....	158,069	553,242	Three pound ..... do....	57,094	6,673
Sardines, in spices:			Clam juice ..... do....	75,000	8,625
Quarters ..... do....	1,062	5,310			
Three-quarters ..... do....	5,609	21,034	Total	.....	1,984,125
One pound ..... do....	74	277			
Two pound ..... do....	10	26	III. Secondary products:		
Odd sizes ..... do....	36	126	Oil ..... gallons..	34,316	8,580
Sardines, in tomato sauce:			Herring pomace ..... tons..	1,941	15,528
One pound ..... do....	256	704	Lobster pomace ..... do....	2,366	20,848
Two pound ..... do....	23	58			
"Brook trout" (herring):			Total	.....	44,956
Three-pound ovals ..... do....	1,100	6,600			
Plain herring:			Total manufactured and secondary products	.....	2,029,081
Three-quarters ..... do....	643	1,608			
One pound ..... do....	6,385	18,176			

42.—Summary by counties of the canning industry of Maine in 1889.

Counties.	Canneries.			No. of employés.	Value of manufactured products.
	No.	Value	Cash capital.		
Washington	31	$239,900	$442,000	3,144	$1,669,727
Hancock	9	58,600	79,500	601	218,241
Knox	4	28,000	28,250	169	101,451
Lincoln	3	9,150	9,300	94	20,363
Cumberland	2	7,800	4,000	9	19,299
Total	49	343,450	563,050	4,017	2,029,081

The combined branches are seen to have given employment to 4,017 persons; the aggregate capital invested, exclusive of boats and vessels, was $906,500; the raw products handled were worth $181,223 to the fishermen; and the manufactured goods had a market value of $2,029,081.

The canning of sardines takes first rank among the shore fishery industries. Of the forty-nine factories enumerated in the table, thirty-seven were engaged to a greater or less extent in the preparation of sardines, the value of which was greatly in excess of that of all the other manufactured products combined. The importance of this industry to the State is very great and warrants all the encouragement which can be extended. Since the last investigation of this subject was made by the U. S. Fish Commission * certain changes have taken place in the methods, etc., in the principal centers of the business, which may be properly recorded in this paper.

One of the principal items of expense in sardine canning is solder, large quantities of which are required in making and sealing the cans. Single firms annually consume

* The American Sardine Industry in 1886, by R. Edward Earll and Hugh M. Smith. Bull. U. S. Fish Commission, 1887.

over 200,000 pounds of this material, the cost price of which is over $30,000. Prior to 1889 the enormous quantities of solder utilized were in the form of bars, and the waste of material and time resulting from the use of this kind of solder was very great. In the year named nearly a dozen firms in the eastern part of the State introduced apparatus for the conversion of the bars into wire, and the use of block solder is now almost wholly discontinued in that region, the canneries having the apparatus supplying those which have not as yet introduced it. In a short time the necessary plant, which costs from $800 to $1,500, will probably be found in all the principal works. In certain canneries a change has come about in the methods of cooking fish. The ordinary ways of baking and frying give place to an endless belt 200 feet long running in a wooden casing 100 feet long, at one end of which a revolving fan forces a blast of hot air over the fish that have been spread on the belt at the other end of the tunnel. After passing along the belt once, the fish go into a bath of boiling oil, and are then treated in the usual manner. The principal advantage arising from the use of this apparatus seems to be the economy of labor, the ten or fifteen flakers required by the old method being represented by one woman who spreads the fish on the belt, and a man who turns a crank which moves the belt. The method as now practiced is clumsy, although the principle is, no doubt, a good one, and about six canneries had, up to 1889, introduced it.

One of the most important events in the history of the sardine industry in its headquarters in eastern Maine was the introduction in 1889, at Eastport, of the apparatus necessary for the decoration of the cans used in the business. Formerly this work was all done in New York, and much time was often lost in waiting for the arrival of the decorated plate; the express or freight charges were also considerable, and the arrangement was never wholly satisfactory. In the spring of 1889 a gentleman connected with a cannery in Eastport purchased the presses, dies, etc., required in this business, and announced himself as prepared to do the work as well as it could be done in New York. Some of the canners were at first skeptical and ordered their supplies as before, but by the end of the season a large majority of the packers were getting their stock from the local manufacturer, and it was thought that the following season would find all the firms patronizing the home establishment. The price charged for decorating the tin is the same as in New York, and the delay and expense of shipping are obviated.

The following tables throw additional light on the sardine business in the two easternmost counties of the State, to which the industry is almost restricted:

43.—*Table showing the classification of the employés of sardine canneries in Washington and Hancock counties, Maine, in 1889, with a statement of the weekly and annual wages.*

Classification of employés.	Washington.	Hancock.	Total.
Proprietors, clerks, and foremen	75	14	89
Boatmen	114	19	133
Sealers and can-makers	728	89	817
Seamers	131	19	150
Cutters and flakers, male	660	127	787
Cutters and flakers, female	467	27	494
Packers, female	548	82	630
General laborers	468	82	550
Total	3,191	459	3,650
Average weekly pay roll	$21,025	$2,605	$28,630
Total annual wages	286,476	59,000	345,476

44.—Table showing the number and value of supply boats employed in the sardine industry of Washington and Hancock counties, Maine, in 1889.

Designation.	Washington.		Hancock.		Total.	
	No.	Value.	No.	Value.	No.	Value.
Steamers	4	$10,700	2	$5,000	6	$15,700
Sailboats	61	16,330	9	2,800	70	19,130
Total	65	27,030	11	7,800	76	34,830

The laws of the State permit the canning of lobsters only during the months of May and June, and fix the minimum size of lobsters used for canning at 9 inches. Lobster-canning in the easternmost counties of the State is done at regular sardine canneries, most of the apparatus and accessories being jointly used in the preparation of these products. The table shows 20 canneries in operation in 1889, employing 577 persons in various capacities. The canned goods were valued at $142,613. The employés shown in the following table are such as were employed in the lobster-canning business, although practically all of those in the first two counties were also engaged in canning sardines. The object of the table is to exhibit the extent of the lobster-canning trade without reference to other associated industries.

45.—Table showing the extent of the lobster-canning industry of Maine in 1889.

Counties.	No. of canneries in operation.	No. of employés.	Lobsters utilized.		Cans prepared.	
			Pounds.	Value.	Number.	Value.
Washington	7	177	2,451,303	$30,988	470,348	$58,794
Hancock	6	157	1,073,323	13,258	253,601	31,700
Knox	4	149	1,772,620	22,158	275,591	40,089
Lincoln	3	94	455,408	5,688	85,501	12,030
Total	20	577	5,752,654	72,092	1,085,041	142,613

Smoked-herring industry.—The smoking of herring in eastern Maine had almost become an extinct business at the time of the abrogation of the fishery clauses of the Washington treaty. Since 1885 the industry has advanced year by year, and in 1889 was probably more extensive than ever before known. The extent of the industry in 1889 is well exhibited in the following table, in which separate figures are shown for the smoked goods prepared from herring taken in American and Canadian weirs:

46.—Table showing the extent of the smoked-herring industry of Maine in 1889.

Designation.	Boxes.	Pounds.	Value.
Caught in Maine weirs—			
Regular size	534,280	2,671,400	$83,615
Bloaters	19,641	491,025	15,369
Total	553,921	3,162,425	98,984
Caught in Canadian weirs—			
Regular size	385,000	1,928,000	60,346
Bloaters	.....	.....	.....
Total	385,000	1,928,000	60,346
Grand total	939,521	5,090,425	159,330

The quantities of fish smoked by the fishermen themselves and at the sardine canneries are shown separately in the following statement. In the regular tables for this State only the herring taken in United States waters and smoked by our fishermen have been returned as smoked, while the American-caught fish that were smoked at the sardine canneries appear as such in the statistics of that industry, but in the products tables are included under fresh herring for the reason that the fish left the hands of the fishermen in a fresh condition.

47.—Table showing the quantities of smoked herring prepared by the fishermen and sardine-canners of Maine in 1889.

Designation.	Boxes.	Pounds.	Value.
Smoked by fishermen—			
Regular size	626,400	3,132,000	$98,031
Bloaters	6,400	160,000	5,008
Total	632,800	3,292,000	103,039
Smoked by sardine canners—			
Regular size	293,480	1,467,400	45,930
Bloaters	13,241	331,025	10,361
Total	306,721	1,798,425	56,291
Grand total	939,521	5,090,425	159,330

For purposes of comparison the quantities of herring smoked in 1880, 1887, 1888, and 1889 are here given in one table. The annual increase since 1885 is very marked.

48.—Comparative table showing the quantity of herring smoked in Maine in 1880, 1887, 1888, and 1889.

Years.	Regular size.			Bloaters.			Total.		
	Boxes.	Pounds.	Value.	Boxes.	Pounds.	Value.	Boxes.	Pounds.	Value.
1880	318,915	2,710,778	$63,783	51,700	1,723,333	$36,190	370,615	4,434,111	$99,973
1887	588,297	2,941,485	88,506	19,120	478,000	11,982	607,417	3,419,485	100,488
1888	755,077	3,775,385	124,705	23,402	585,050	15,449	778,479	4,360,435	140,154
1889	919,880	4,599,400	143,961	19,641	491,025	15,369	939,521	5,090,425	159,330

NOTE.—In 1880 the average weight of a box of regular-size herring was 8½ pounds and of bloaters 33⅓ pounds. Since that year there appears to have been a decrease in the size of boxes used, for in 1889 the average net weight of fish in the ordinary boxes was 5 pounds and in the larger boxes 25 pounds.

The menhaden industry.—The return of menhaden to the waters of Maine has caused the revival of an industry which formerly was of great value to the State. Already the capital devoted to it amounts to $112,015, and it seems probable that the near future will give evidence of a still more marked increase in the business. The details of the industry as it existed in 1889 are shown in Table 49.

49.—Table showing the extent of the menhaden industry of Maine.

Designation.	1889.	Designation.	1889.
Number of factories in operation	3	Number of sailing vessels employed	13
Value of factories	$22,200	Net tonnage	398.10
Amount of cash capital	$20,000	Value	$15,950
Number of shoresmen employed	104	Value of outfit	$13,065
Number of fishermen employed	195	Number of menhaden handled	*26,057,583
Number of steam vessels employed	4	Value to fishermen	$31,269
Net tonnage	218.22	Number of gallons of oil made	282,465
Value	$32,000	Value as sold	$62,409
Value of outfit	$8,800	Number of tons of scrap produced	2,305
		Value as sold	$24,735

*This number represents considerable quantities taken by vessels owned in other States and is larger than the aggregate catch of menhaden by citizens of Maine.

III.—THE FISHERIES OF NEW HAMPSHIRE.

GENERAL REMARKS AND STATISTICS.

Compared with other New England States, the fisheries of New Hampshire have never been important, and in recent years have shown a serious decline. The coast line of New Hampshire is occupied by a single county, Rockingham, to which the entire fishery interests of the State belong.

Three tables covering the combined fisheries of the State are first presented. These give 365 persons engaged in the industry, with an invested capital of $112,660, taking 4,354,568 pounds of products, valued at $88,511.

50.—Table of persons employed.

How engaged.	No.
On fishing vessels	141
In shore fisheries	194
On shore, in factories, fish-houses, etc	30
Total	365

51.—Table of apparatus and capital.

Designation.	No.	Value.	Designation.	No.	Value.
Vessels, fishing (tonnage, 588.05)	15	$32,000	Apparatus of capture—shore fisheries:		
Outfit	.....	11,099	Weirs	12	$860
Boats	73	4,170	Haul seines	3	100
Apparatus of capture—vessel fisheries:			Gill nets	107	1,246
Seines	7	3,700	Trawl lines and hand lines	.....	920
Trawl lines and hand lines	.....	12,251	Pots	2,040	2,500
Gill nets	27	324	Shore property	.....	32,100
Pots	200	300	Cash capital	.....	11,000
Harpoons	6	90	Total	.....	112,660

52.—Table of products.

Species.	Pounds.	Value.	Species.	Pounds.	Value.
Alewives, fresh	140,400	$3,080	Perch or cunners, fresh	4,000	$200
Cod, fresh	1,178,655	23,222	Pollock, fresh	7,000	70
Cod, salted	195,000	5,325	Sea bass, fresh	500	40
Cusk, fresh	33,500	350	Shad, fresh	88	3
Eels, fresh	12,000	1,200	Smelt, fresh	46,000	3,600
Haddock, fresh	1,470,055	25,071	Swordfish, fresh	25,100	1,159
Haddock, salted	90,000	1,112	Swordfish, salted	3,600	180
Hake, fresh	227,295	2,353	Miscellaneous fish, fresh	10,000	300
Hake, salted	110,000	1,400	Lobsters, fresh	137,175	6,415
Halibut, fresh	87,600	6,132	Clams (soft), fresh	*3,000	150
Herring, fresh	19,800	195	Oil	†6,370	260
Mackerel, fresh	21,860	2,010			
Mackerel, salted	24,600	2,359	Total	4,354,568	88,511
Menhaden, fresh	501,000	2,325			

* 300 bushels. † 849 gallons.

THE VESSEL FISHERIES.

It is in the vessel fishery that the principal decline has occurred, the number of craft being 23 in 1880 and only 15 in 1889. The shore fishery is the most important branch in which the vessels of the State engage, 11 out of the entire number following this fishery to a greater or less extent. The fishery for mackerel with seines, nets, and lines ranks next, employing 7 vessels. The market, halibut, swordfish, menhaden, and lobster fisheries have a single vessel in each. The details of tonnage, value, and crew for each fishery are brought out in the following table.

53.—Table showing the number of vessels engaged in each fishery in New Hampshire in 1889, together with their tonnage, value, and number of crew.

Fisheries.	No. of vessels engaged.	Net tonnage.	Value.	Number and nationality of fishermen.			
				Americans.	British provincials.	All others.	Total.
Market	1	68.93	$2,800	6	4	2	12
Halibut	1	68.93	2,800	6	4	2	12
Mackerel, caught with seines	4	186.91	11,700	43	4	1	48
Mackerel, caught with nets	1	14.63	1,000	5	.....	.....	5
Mackerel, caught with lines	2	42.42	1,900	12	.....	.....	12
Shore	11	337.06	16,400	88	4	4	96
Swordfish	1	30.93	1,600	9	.....	.....	9
Menhaden	1	89.63	6,000	16	.....	.....	16
Lobster	1	19.41	1,300	6	.....	.....	6

From the next table it is seen that, taking the value of the products as a basis, the shore vessel fishery yields about three-fourths of the total catch, followed by the halibut, mackerel, menhaden, market, swordfish, and lobster. If quantities only are considered, the menhaden fishery ranks second and the market fishery third.

54.—Table showing by fisheries and species the yield of the vessel fisheries of New Hampshire in 1889.

Fisheries and species.	Pounds.	Value.	Fisheries and species.	Pounds.	Value.
Shore:			Mackerel:		
Cod, fresh	639,355	$14,182	Mackerel, fresh	19,700	$1,770
Cod, salted	195,000	5,325	Mackerel, salted	24,600	2,359
Cusk, fresh	33,500	350			
Haddock, fresh	826,025	14,821	Total	44,300	4,129
Haddock, salted	90,000	1,112			
Hake, fresh	227,295	2,353	Swordfish:		
Hake, salted	110,000	1,400	Swordfish, fresh	25,100	1,159
Pollock, fresh	7,000	70	Swordfish, salted	3,600	180
Total	2,128,175	39,613	Total	28,700	1,339
Market:			Menhaden:		
Cod, fresh	103,900	1,800	Menhaden, fresh	464,000	2,100
			Crustacean:		
Halibut:			Lobsters	14,175	645
Halibut, fresh	87,600	6,132			
			Grand total	2,870,850	55,758

The following table shows the quantity and value of each species taken in the vessel fisheries of New Hampshire in 1889:

55.—Table showing by species the yield of the vessel fisheries of New Hampshire in 1889.

Species.	Pounds.	Value.	Species.	Pounds.	Value.
Cod, fresh	743,255	$15,982	Mackerel, salted	24,600	$2,359
Cod, salted	195,000	5,325	Menhaden, fresh	464,000	2,100
Cusk, fresh	33,500	350	Pollock, fresh	7,000	70
Haddock, fresh	826,025	14,821	Swordfish, fresh	25,100	1,159
Haddock, salted	90,000	1,112	Swordfish, salted	3,600	180
Hake, fresh	227,295	2,353	Lobsters, fresh	14,175	645
Hake, salted	110,000	1,400	Oil	6,370	260
Halibut, fresh	87,600	6,132			
Mackerel, fresh	19,700	1,770	Total	2,877,220	56,018

From the foregoing tables the following average figures for the vessels of New Hampshire may be deduced: The average tonnage is 39.20, the average value per ton is $54, the average value of vessels is $2,133, the average value of apparatus and outfit is $1,851, the average number of crew is 9, the average value of catch per man is $397, the average value of catch per vessel is $3,734, the average value of catch per net ton is $95, and the average value of catch for each $100 invested in the vessel fishery is $95.

Cod is by far the most important species taken in the vessel fisheries, representing 38 per cent of the stock. Haddock yields 28 per cent, halibut 11 per cent, and hake and mackerel 7 per cent each.

In the table showing the vessel catch of fish by apparatus the prominent position of hand lines and trawl lines as means of capture will be at once apparent, more than three-fourths of the quantity and about seven-eighths of the value accruing from this source. Seines are the next important apparatus, followed by harpoons and nets.

56.—Table showing by apparatus and species the yield of the vessel fisheries of New Hampshire in 1889, exclusive of the lobster fisheries.

Apparatus and species.	Pounds.	Value.	Apparatus and species.	Pounds.	Value.
Lines:			Seines:		
Cod, fresh	743,255	$15,982	Mackerel, fresh	8,000	$710
Cod, salted	195,000	5,325	Mackerel, salted	24,600	2,359
Cusk, fresh	33,500	350	Menhaden, fresh	464,000	2,100
Haddock, fresh	826,025	14,821			
Haddock, salted	90,000	1,112	Total	496,600	5,169
Hake, fresh	227,295	2,353			
Hake, salted	110,000	1,400	Harpoons:		
Halibut, fresh	87,600	6,132	Swordfish, fresh	25,100	1,159
Mackerel, fresh	8,700	780	Swordfish, salted	3,600	180
Pollock, fresh	7,000	70			
			Total	28,700	1,339
Total	2,328,375	48,325			
			Grand total	2,856,675	55,113
Gill nets:					
Mackerel, fresh	3,000	280			

THE SHORE FISHERIES.

The shore fisheries of New Hampshire yield about one-half as much products as the vessel fisheries and rather more than half the value of the latter. The 194 shore fishermen have $4,170 invested in boats and $5,626 in apparatus, as shown in the second table for the State, and in 1889 took the following products:

57.—Table showing by species the yield of the shore fisheries of New Hampshire in 1889.

Species.	Pounds.	Value.	Species.	Pounds.	Value.
Alewives, fresh	140,400	$3,080	Sea bass, fresh	500	$40
Cod, fresh	435,400	7,240	Shad, fresh	88	3
Eels, fresh	12,000	1,200	Smelt, fresh	46,000	3,600
Haddock, fresh	644,000	10,250	Miscellaneous fish, fresh	10,000	300
Herring, fresh	19,800	195	Lobsters, fresh	123,000	5,770
Mackerel, fresh	2,160	240	Clams (soft), fresh	3,000	150
Menhaden, fresh	37,000	225			
Perch or cunners, fresh	4,000	200	Total	1,477,348	32,493

The foregoing table shows that the average value of the products taken by the shore fishermen of New Hampshire is $167 per man, $774 per each $100 invested in boats, and $580 per each $100 invested in apparatus. It is also seen that 32 per cent of the income of the shore fishermen is obtained from the sale of haddock, 22 per cent from cod, 17 per cent from lobsters, 11 per cent from smelt, 9 per cent from alewives, 4 per cent from eels, and 1 per cent each from mackerel, menhaden, herring, perch, and minor species.

The importance of the various fishing devices employed in the shore fisheries of the State is exhibited in the following table, in which the quantity and value of each species taken in each form of apparatus are given.

58.—Table showing by apparatus and species the yield of the shore fisheries of New Hampshire in 1889.

Apparatus and species.	Pounds.	Value.	Apparatus and species.	Pounds.	Value.
Weirs:			Trawl lines and hand lines:		
Alewives, fresh	133,200	$2,960	Cod, fresh	435,400	$7,240
Perch, fresh	4,000	200	Haddock, fresh	644,000	10,250
Sea bass, fresh	500	40	Smelt, fresh	45,000	3,500
Shad, fresh	88	3	Miscellaneous, fresh	10,000	300
Smelt, fresh	1,000	100			
Total	138,788	3,303	Total	1,134,400	21,290
Seines:			Spears:		
Alewives, fresh	7,200	120	Eels, fresh	12,000	1,200
Gill nets:			Miscellaneous:		
Herring, fresh	19,800	195	Lobsters	123,000	5,770
Mackerel, fresh	2,160	240	Clams (soft)	3,000	150
Menhaden, fresh	37,000	225			
Total	58,960	660	Total	126,000	5,920
			Grand total	1,477,348	32,493

Examination of the table shows that lines are to be credited with 65 per cent of the stock, weirs with 10 per cent, spears with 4 per cent, gill nets with 2 per cent, seines with 1 per cent, and pots and other minor apparatus with 18 per cent.

IV.—THE FISHERIES OF MASSACHUSETTS.

GENERAL REMARKS AND STATISTICS.

The fisheries of Massachusetts are more important than those of any other State. Especially prominent are the offshore bank fisheries for cod, halibut, haddock, and other ground fish; the mackerel fishery; and the whale fishery, which is prosecuted by fleets rendezvousing in, or refitting from, both Massachusetts and California ports. The shore and boat fisheries for alewives, herring, mackerel, scup, sea bass, lobsters, oysters, clams, and algæ are also of considerable magnitude.

Statistical presentations are given of the vessel fisheries, the shore fisheries, the wholesale fish trades of Boston and Gloucester, and the arrivals of fish at these ports classified by fishing-grounds. The entire commercial fisheries of the State are embraced by the tables and discussions. Three general tables covering the fisheries of the State are first given; these relate to persons engaged; vessels, boats, apparatus and capital; and products and values.

59.—Table of persons employed.

How engaged.	No.
On fishing vessels	10,760
On transporting vessels	91
In shore fisheries	3,748
On shore, in factories, fish-houses, etc	2,639
Total	17,238

60.—Table of apparatus and capital.

Designation.	No.	Value.
Vessels fishing (tonnage, 57,984.18)	814	$3,042,745
Outfit	.....	1,533,398
Vessels transporting (tonnage, 1,275.12)	22	55,600
Outfit	.....	7,425
Boats	3,494	254,033
Apparatus of capture—vessel fisheries:		
Seines	235	120,600
Gill nets	1,049	11,459
Snap nets	27	73
Trawl lines and hand lines	.....	561,746
Pots	1,200	1,600
Harpoons*	108	810
Dredges and rakes	42	146
Apparatus of capture—shore fisheries:		
Pound nets, trap-nets, and weirs	224	222,583
Haul seines	58	4,245
Gill nets	3,128	32,753
Trammel nets	4	70
Fyke nets	15	100
Snap nets, dip nets, etc	514	991
Pots	27,294	38,697
Trawl lines and hand lines	.....	3,770
Harpoons and spears	.....	569
Dredges, tongs, and rakes	.....	9,409
Shore property	.....	3,058,207
Cash capital	.....	4,284,200
Total	.....	13,245,229

*The harpoons, guns, etc., used on whaling vessels are included under "outfit," and are therefore omitted from enumeration under this head.

61.—Table of products.

Species.	Vessel fisheries.		Shore fisheries.		Total.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Albacore, fresh			74,700	$291	74,700	$291
Alewives, fresh			2,032,691	29,173	2,032,691	29,173
Alewives, salted	6,600	$66	1,245,350	22,216	1,251,950	22,282
Bluefish, fresh	74,954	5,111	322,013	28,675	396,967	33,786
Bonito, fresh			194,066	8,157	194,066	8,157
Bonito, salted			1,400	88	1,400	88
Butter-fish, fresh	6,000	180	756,438	22,928	762,438	23,108
Cod, fresh	19,413,205	475,761	1,692,508	32,105	21,105,713	507,866
Cod, salted	54,698,109	1,487,218	538,179	17,814	55,236,288	1,505,032
Cunners, fresh	80,000	1,120	348,095	17,668	428,095	18,788
Cusk, fresh	431,778	4,932			431,778	4,932
Cusk, salted	399,405	6,853			399,405	6,853
Eels, fresh			424,708	24,295	424,708	24,295
Flounders, fresh	10,854	217	946,919	20,749	957,773	20,966
Frostfish or tomcod, fresh			4,873	113	4,873	113
Grouper, fresh	16,838	269			16,838	269
Haddock, fresh	33,832,526	580,723	775,511	11,450	34,608,037	592,173
Haddock, salted	697,380	9,593			697,380	9,593
Hake, fresh	4,875,506	51,445	622,800	4,245	5,498,306	55,690
Hake, salted	855,198	12,242			855,198	12,242
Halibut, fresh	8,913,260	611,640	200	14	8,913,460	611,654
Halibut, salted	974,930	48,932			974,930	48,932
Herring, fresh	273,390	2,334	7,647,088	63,888	7,920,478	66,222
Herring, salted	956,800	13,434	1,054,100	11,106	2,010,900	24,540
Hickory shad			8,640	219	8,640	219
Kingfish, fresh			4,241	353	4,241	353
Mackerel, fresh	992,151	90,364	1,312,877	99,710	2,305,028	190,074
Mackerel, salted	4,148,100	371,153	234,067	23,364	4,382,167	394,517
Menhaden, fresh	1,620,606	8,679	574,336	3,977	2,203,936	12,656
Menhaden, salted	167,200	2,872	3,600	72	170,800	2,944
Pollock, fresh	2,937,438	30,278	155,000	1,623	3,092,438	31,901
Pollock, salted	1,967,421	23,448	9,380	109	1,976,801	23,557
Red snapper, fresh	211,156	6,057			211,156	6,057
Salmon, fresh			139	66	139	66
Scup, fresh	27,733	829	2,473,432	81,824	2,501,165	82,653
Sea bass, fresh	23,067	1,503	791,017	55,292	814,084	56,795
Shad, fresh	67,200	2,036	43,524	1,926	110,724	3,962
Shad, salted	120,800	3,302	2,800	104	123,600	3,406
Spanish mackerel, fresh	20,000	1,600	3,461	873	23,461	2,473
Smelt, fresh			10,700	1,098	10,700	1,098
Squeteague, fresh			216,571	10,929	216,571	10,929
Striped bass, fresh			24,878	2,669	24,878	2,669
Sturgeon, fresh			2,800	132	2,800	132
Swordfish, fresh	232,424	10,207	15,400	843	247,824	11,050
Swordfish, salted	7,200	334			7,200	334
Tautog, fresh	33,972	2,055	612,393	22,310	646,365	24,365
Whiting, fresh			114,449	1,399	114,449	1,399
Miscellaneous fish, fresh	2,200	44	4,367	110	6,567	154
Miscellaneous fish, salted	54,200	696			54,200	696
Refuse fish, fresh			1,024,400	1,093	1,024,400	1,093
Squid, fresh			567,800	4,466	567,800	4,466
Shrimp, fresh			2,365	860	2,365	860
Lobsters, fresh	80,225	3,836	3,273,562	144,656	3,353,787	148,492
Oysters, fresh			258,867	65,538	[a]258,867	65,538
Clams (soft), fresh	6,800	604	2,236,510	123,283	[b]2,243,310	123,947
Clams (soft), salted			274,920	13,764	[c]274,920	13,764
Quahogs, fresh			135,304	12,549	[d]135,304	12,549
Scallops, fresh	14,875	2,905	102,357	23,869	[e]117,232	26,774
Halibut fins, salted	62,000	2,754			62,000	2,754
Sounds	43,933	1,316			43,933	1,316
Tongues	251,383	5,026			251,383	5,026
Oil, fish	2,160,309	77,768			[f]2,160,309	77,768
Oil, whale	6,171,518	488,524			[g]6,171,518	488,524
Ambergris	37	7,750			37	7,750
Whalebone	98,268	320,115			98,268	320,115
Algæ			117,993,900	66,034	117,993,900	66,034
Total	148,047,973	4,778,185	151,169,696	1,080,089	299,217,669	5,858,274

[a] 36,981 bushels. [b] 224,331 bushels. [c] 1,375 barrels. [d] 16,913 bushels.
[e] 33,495 bushels. [f] 288,041 gallons. [g] 822,869 gallons.

THE VESSEL FISHERIES.

The vessels employed in the fisheries of Massachusetts are chiefly distinguished for their relatively high value and large size. Those engaged in the food fisheries are the best of their class in the country. The fishing fleet is much more numerous and important than in any other New England State; and, with the exception of Maryland, Massachusetts has a larger number of fishing vessels than any other State.

Statistics of the vessel fisheries are exhibited from the following points of view: By counties, by customs districts, by apparatus, by fishing-grounds, and by fisheries.

There are seven counties in Massachusetts from which vessel fishing is now carried on; these are Essex, Suffolk, Plymouth, Barnstable, Nantucket, Dukes, and Bristol. The extent of the industry in each is clearly shown in the following tables.

The first table indicates that of the 10,760 persons employed on the fishing fleet of Massachusetts, 5,729 are on vessels belonging in Essex County, in which is situated the great fishing port of Gloucester, and 2,295 on vessels in Barnstable County, while only 13 vessel fishermen are credited to Plymouth County. Vessels engaged in transporting fishery products carried 91 men, of whom 42 were in Barnstable County and 22 in Essex County.

The first table also gives the number of Americans, British provincials, and other foreigners constituting the crews of the fishing vessels of Massachusetts. As already stated, this is one of the most important questions connected with the fishery marine of New England; it is also one which has been the subject of much misstatement and misapprehension. The table shows that of the 10,851 persons on the fishing vessels of Massachusetts in 1889, 8,002, or 73.7 per cent, were American citizens, 1,157, or 10.7 per cent, were British provincials, and 1,692, or 15.6 per cent, were subjects of other countries. The general tendency among fishermen of foreign birth, so far as information can be obtained, is to become naturalized, marry, and acquire homes at the various fishing ports; many of them own the whole or part of the vessels in which they sail.

The second table of this series shows that $5,335,602 was invested in the vessel fisheries of Massachusetts in 1889, of which sum $2,858,250, or more than half, is credited to Essex County, and $1,136,250 to Bristol County. The former county had 442 fishing vessels, or considerably more than half of the fishing fleet of the State, followed by Barnstable County with 188, and Bristol County with 80. The vessels employed in transporting numbered 22, of which 10 were in Barnstable County. Trawl lines and hand lines are the most widely adopted and important apparatus employed in the vessel fisheries of the State; the quantity used in 1889 was valued at over $550,000. Seines to the number of 235, worth $120,600, were carried by mackerel vessels, chiefly in Essex, Barnstable, and Suffolk counties. Gill nets, the next important means of capture, are fished chiefly in Essex and Barnstable counties, in which 988 of the total number operated, viz, 1,049, were owned. The minor apparatus carried by the vessels of Massachusetts consists of snap nets, harpoons, pots, rakes, and dredges. The devices used in the whale fishery are of such a miscellaneous nature that it has not been found practicable to classify them or show them separately under the head of apparatus. Their value has been included with that of the outfit of the vessels in the tables.

The vessel fisheries of Massachusetts are seen to have yielded 148,047,973 pounds in 1889, of which the value at first hands was $4,778,185. The most important single product was the cod, of which 74,111,314 pounds, worth $1,962,979, were obtained. No other species was valued as high as $1,000,000, and the combined value of the various products of the whale fishery was only $816,389. The great relative and actual importance of the cod is thus clearly indicated. The next most prominent species are the halibut, 9,888,190 pounds, valued at $660,572; the haddock, 34,529,906 pounds, worth $590,316; and the mackerel, 5,140,251 pounds, worth $461,547.

62.—Table showing by counties the number and nationality of men employed in the vessel fisheries of Massachusetts in 1889.

Counties.	Number and nationality of men on fishing vessels.				Number and nationality of men on transporting vessels.			
	Americans.	British provincials.	All others.	Total.	Americans.	British provincials.	All others.	Total.
Essex	5,133	298	298	5,729	22	.....	.....	22
Suffolk	573	66	143	782	10	.....	.....	10
Plymouth	13	.....	.....	13	.....	.....	.....	.....
Barnstable	1,327	497	471	2,295	42	.....	.....	42
Nantucket	32	.....	.....	32	.....	.....	.....	.....
Dukes	94	16	15	125	4	.....	.....	4
Bristol	739	280	765	1,784	13	.....	.....	13
Total	7,911	1,157	1,692	10,760	91	.....	.....	91

63.—Table showing by counties the number and value of vessels and apparatus employed in the vessel fisheries of Massachusetts in 1889.

Counties.	Vessels.							
	Fishing.				Transporting.			
	No.	Net tonnage.	Value.	Value of outfit.	No.	Net tonnage.	Value.	Value of outfit.
Essex	442	28,380.54	$1,053,800	$714,612	4	322.12	$14,800	$1,000
Suffolk	66	3,678.29	201,820	68,673	2	113.92	4,500	600
Plymouth	2	55.85	2,400	1,390	.....	.....	.....	.....
Barnstable	188	11,786.22	522,250	241,357	10	479.40	21,500	2,075
Nantucket	16	109.65	7,000	619	.....	.....	.....	.....
Dukes	20	642.78	24,900	10,220	2	21.07	2,400	250
Bristol	80	13,330.85	630,575	487,527	4	338.61	12,400	3,500
Total	814	57,984.18	3,042,745	1,533,398	22	1,275.12	55,600	7,425

Counties.	Apparatus of capture.														Total investment.
	Seines.		Gill nets.		Snap nets.		Trawl lines and hand lines.		Pots.		Harpoons.*		Dredges and rakes.		
	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	
Essex	155	$77,500	468	$5,285	....	.....	....	$390,433	450	$550	36	$270	....	.....	$2,858,250
Suffolk	21	10,500	44	656	27	$73	....	71,405	500	800	4	30	....	.....	359,057
Plymouth	.....	.....	.....	.....	....	.....	....	135	.....	.....	.....	.....	....	.....	3,925
Barnstable	57	31,950	520	4,718	....	.....	....	98,430	.....	.....	8	60	....	.....	922,340
Nantucket	.....	.....	.....	.....	....	.....	....	205	.....	.....	.....	.....	24	$96	7,920
Dukes	1	150	14	650	....	.....	....	141	.....	.....	16	120	10	29	47,860
Bristol	1	500	3	150	....	.....	....	997	250	250	44	330	8	21	1,136,250
Total	235	120,600	1,049	11,459	27	73	....	561,746	1,200	1,600	108	810	42	146	5,335,602

* The harpoons here enumerated were those used for the capture of swordfish.

64.—Table showing by counties and species the yield of the vessel fisheries of Massachusetts in 1889.

Species.	Essex.		Suffolk.		Plymouth.		Barnstable.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Alewives, salted	6,600	$66						
Bluefish, fresh							24,927	$1,521
Butter-fish, fresh	6,000	180						
Cod, fresh	9,567,201	215,959	4,077,470	$103,978	96,500	$1,875	5,594,012	151,441
Cod, salted	46,443,153	1,224,557	1,695,370	39,295			6,376,986	217,611
Cunners, fresh			80,000	1,120				
Cusk, fresh	263,122	2,987	75,456	756			93,200	1,189
Cusk, salted	399,405	6,853						
Flounders, fresh							7,600	152
Groupers, fresh			16,868	269				
Haddock, fresh	17,401,875	322,946	10,304,670	157,956	94,500	1,580	6,028,281	98,174
Haddock, salted	684,380	9,463					13,000	130
Hake, fresh	1,870,083	20,866	1,678,523	16,787	1,900	20	1,325,000	13,772
Hake, salted	855,198	12,242						
Halibut, fresh	8,244,048	554,013	190,956	18,776			478,256	38,851
Halibut, salted	974,930	48,932						
Herring, fresh	211,200	1,951	60,750	377			1,440	6
Herring, salted	699,800	9,915	245,006	3,369			12,000	150
Mackerel, fresh	584,040	48,976	252,976	27,458	41,100	4,110	98,704	8,626
Mackerel, salted	2,786,200	256,490	222,000	21,004			1,015,600	84,246
Menhaden, fresh	269,000	1,385	68,600	344			1,200,000	6,000
Menhaden, salted	167,200	2,872						
Pollock, fresh	2,325,004	23,278	94,334	1,660			518,100	5,340
Pollock, salted	1,516,066	17,401	255	3			451,100	6,044
Red snapper, fresh	120,000	3,600	91,156	2,457				
Shad, fresh	41,400	1,616	6,000	180			19,800	240
Shad, salted	26,000	780					94,800	2,522
Spanish mackerel, fresh	20,000	1,600						
Swordfish, fresh	108,958	5,305	9,100	344			12,700	419
Swordfish, salted	4,800	250						
Tautog, fresh							15,000	1,100
Miscellaneous fish, fresh							2,200	44
Miscellaneous fish, salted	54,200	696						
Lobsters	37,500	1,635	13,500	666				
Clams (soft)	6,400	614						
Halibut fins	62,000	2,754						
Sounds	23,911	716	11,189	335			8,833	265
Tongues	213,929	4,278	7,706	154			28,986	579
Oil, fish	1,456,287	52,425	335,019	12,060			364,854	13,134
Oil, whale			48,750	4,225			504,263	42,655
Whalebone							1,200	84
Total	97,449,890	2,857,601	19,585,648	413,576	234,000	7,585	24,290,842	694,295

Species.	Nantucket.		Dukes.		Bristol.		Total for State.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Alewives, salted							6,600	$66
Bluefish, fresh	20,000	$1,600	28,427	$1,862	1,600	$128	74,954	5,111
Butter-fish, fresh							6,000	180
Cod, fresh	15,000	375	10,722	362	52,300	1,771	19,413,205	475,761
Cod, salted	15,000	600			167,600	5,155	54,698,109	1,487,218
Cunners, fresh							80,000	1,120
Cusk, fresh							431,778	4,932
Cusk, salted							399,405	6,853
Flounders, fresh			3,254	65			10,854	217
Groupers, fresh							16,868	269
Haddock, fresh			3,200	64			33,832,526	580,723
Haddock, salted							697,380	9,593
Hake, fresh							4,875,506	51,445
Hake, salted							855,198	12,242
Halibut, fresh							8,913,260	611,640
Halibut, salted							974,930	48,932
Herring, fresh							273,390	2,334
Herring, salted							956,806	13,434
Mackerel, fresh	8,000	800	6,331	294	1,000	100	992,151	90,364
Mackerel, salted	5,000	500	14,100	1,122	105,200	7,791	4,148,100	371,153
Menhaden, fresh			32,000	800	60,000	150	1,629,600	8,679
Menhaden, salted							167,200	2,872
Pollock, fresh							2,937,438	30,278
Pollock, salted							1,967,421	23,448
Red snapper, fresh							211,156	6,057
Sea bass, fresh			23,067	1,503			23,067	1,503
Scup, fresh			16,900	431	10,833	398	27,733	829
Shad, fresh							67,200	2,036
Shad, salted							120,800	3,302
Spanish mackerel, fresh							20,000	1,600
Swordfish, fresh			25,466	1,022	76,206	3,117	232,424	10,207

64.—Table showing by counties and species the yield of the vessel fisheries of Massachusetts in 1889—Cont'd.

Species.	Nantucket.		Dukes.		Bristol.		Total for State.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Swordfish, salted			2,400	$84			7,200	$334
Tautog, fresh					18,972	$955	33,972	2,055
Miscellaneous fish, fresh							2,200	44
Miscellaneous fish, salted							54,200	696
Lobsters					29,225	1,535	80,225	3,836
Clams (soft)			400	50			6,800	664
Scallops	7,000	$1,400	7,175	1,305	700	200	14,875	2,905
Halibut fins							62,000	2,754
Sounds							43,933	1,316
Tongues					762	15	251,383	5,026
Oil, fish					4,149	149	2,160,309	77,768
Oil, whale			161,025	14,084	5,457,480	427,560	6,171,518	488,524
Ambergris					37	7,750	37	7,750
Whalebone					97,068	320,031	98,268	320,115
Total	70,000	5,275	334,467	23,048	6,083,126	776,805	148,047,973	4,778,185

Certain averages which throw considerable light on the vessel fisheries of the various counties are given in the following table. The greatest average tonnage is found in Bristol County, in which the whaling vessels constitute a prominent part of the fishing fleet; in Nantucket County, where the shore fishery with lines and nets is the principal branch, the vessels have the least average tonnage; the extremes, as represented by these two counties, are 166.64 and 6.85 tons, respectively. The average value per ton is, singularly enough, greatest in Nantucket County and least in Bristol County. Among the important fishing counties, the average value per ton is greatest in Essex County. The average value of vessels is naturally greatest in Bristol County, in which the vessels are largest, after which comes Essex County. The same statement applies to the average value of apparatus and outfit and the average number of crew. The average value of catch per man is highest in Plymouth County and lowest in Nantucket County. After Plymouth come Suffolk, Essex, and Bristol. In the average stock per vessel Bristol County takes considerable precedence over any other, with $9,710; then come Essex with $6,465 and Suffolk with $6,266. For each ton employed Plymouth County in 1889 took products to the value of $136, Suffolk County $112, and Essex County $101. For each $100 invested in the vessel fisheries the last-named county also took products worth $101, while Plymouth County is credited with $194 and Suffolk County with $117.

65.—Table showing by counties certain average figures for the vessels employed in the fisheries of Massachusetts in 1889.

Counties.	Net tonnage.	Value per ton.	Value per vessel.	Value of apparatus and outfit.	No. of men to vessel.	Value of catch per man.	Value of catch per vessel.	Value of catch per each ton employed.	Value of catch per each $100 invested in fishing vessels.
Essex	64.21	$58	$3,742	$2,089	13	$499	$6,465	$101	$101
Suffolk	55.73	55	3,058	2,305	12	529	6,266	112	117
Plymouth	27.93	43	1,200	763	7	583	3,793	136	194
Barnstable	62.69	44	2,778	2,003	12	302	3,693	59	77
Nantucket	6.85	64	438	58	2	165	330	48	67
Dukes	32.14	39	1,245	1,016	6	184	1,152	36	51
Bristol	166.64	47	7,882	6,122	22	435	9,710	58	69

The comparative importance of each of the principal fishery products in the various counties is shown in the next table. The figures represent the percentage of the value of each species to the total yield in each county.

66.—Table showing by counties the percentage of value of each species or product taken in the vessel fisheries of Massachusetts in 1889.

Species.	Essex.	Suffolk.	Plymouth.	Barnstable.	Nantucket.	Dukes.	Bristol.
Alewives, salted	[.002]						
Bluefish, fresh				.22	30.33	8.08	.02
Butter-fish, fresh	.01						
Cod, fresh	7.56	25.14	24.72	21.81	7.11	1.57	.23
Cod, salted	42.85	9.50		31.34	11.37		.66
Cunners, fresh		.27					
Cusk, fresh	.10	.18		.17			
Cusk, salted	.24						
Flounders, fresh				.02		.28	
Groupers, fresh		.07					
Haddock, fresh	11.30	38.19	20.83	14.14		.28	
Haddock, salted	.33			.02			
Hake, fresh	.73	4.06	.26	1.98			
Hake, salted	.43						
Halibut, fresh	19.39	4.54		5.60			
Halibut, salted	1.71						
Herring, fresh	.07	.09					
Herring, salted	.35	.82		.02			
Mackerel, fresh	1.71	6.64	54.19	1.24	15.17	1.28	.01
Mackerel, salted	8.97	5.08		12.14	9.48	4.87	1.00
Menhaden, fresh	.05	.08		.87		3.47	.02
Menhaden, salted	.10						
Pollock, fresh	.81	.40		.77			
Pollock, salted	.61			.87			
Red snapper, fresh	.13	.60					
Sea bass, fresh						6.52	
Scup, fresh						1.87	.05
Shad, fresh	.06	.04		.04			
Shad, salted	.03			.36			
Spanish mackerel, fresh	.06						
Swordfish, fresh	.19	.08		.06		4.43	.40
Swordfish, salted	.01					.36	
Tautog, fresh				.16			.12
Miscellaneous fish, fresh				.01			
Miscellaneous fish, salted	.02						
Lobsters	.06	.16					.20
Clams (soft)	.02					.22	
Scallops					26.54	5.66	.03
Halibut fins	.10						
Sounds	.02	.08		.04			
Tongues	.15	.04		.08			
Oil, fish	1.83	2.92		1.89			.02
Oil, whale		1.02		6.14		61.11	55.04
Ambergris							1.00
Whalebone				.01			41.20
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00

The customs districts of Massachusetts having fishing vessels are 10 in number and correspond to some extent with the counties. Table 67 shows in great detail the quantities and values of products taken in each district. Table 68 gives a summary of the vessel fisheries classified by customs districts. A series of average figures is presented in Table 69.

67.—Table showing by species and customs districts the yield of the vessel fisheries of Massachusetts in 1889.

Species.	Newburyport.		Gloucester.		Salem and Beverly.		Marblehead.		Boston.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
Alewives, salted			6,600	$66						
Butter-fish, fresh			6,000	180						
Cod, fresh	144,000	$3,280	7,890,608	178,948	402,993	$8,849	1,129,600	$24,882	4,077,470	$103,978
Cod, salted	6,000	175	44,682,140	1,178,811	1,520,013	38,411	235,000	7,160	1,695,370	39,295
Cunners, fresh									80,000	1,120
Cusk, fresh			261,622	2,971			1,500	16	75,456	756
Cusk, salted			399,405	6,853						
Grouper, fresh									16,868	269
Haddock, fresh	71,000	1,460	16,459,375	304,361	53,000	935	818,500	16,190	10,304,670	157,959
Haddock, salted			605,875	8,643	78,505	820				
Hake, fresh			1,683,810	18,977	4,273	34	182,000	1,855	1,678,523	16,787
Hake, salted			838,948	11,955	16,250	287				
Halibut, fresh			8,242,125	553,864	1,450	102	473	47	190,956	18,776
Halibut, salted			972,237	48,807	2,693	125				
Herring, fresh			197,000	1,790			14,200	161	60,750	377
Herring, salted			650,200	9,303	49,600	612			245,000	3,369

67.—*Table showing by species and customs districts the yield of the vessel fisheries of Massachusetts in 1889*—Continued.

Species.	Newburyport.		Gloucester.		Salem and Beverly.		Marblehead.		Boston.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
Mackerel, fresh	9,400	$910	54,600	$5,400			520,040	$666	252,976	$27,458
Mackerel, salted	33,600	2,025	2,724,000	251,761	11,200	$1,101	17,400	42,603	222,000	21,004
Menhaden, fresh			110,600	1,007			158,400	1,378	68,600	344
Menhaden, salted			167,200	2,872						
Pollock, fresh			2,027,131	19,582	10,273	154	287,600	3,542	94,334	1,660
Pollock, salted			1,503,066	17,271	13,000	130			255	3
Red snapper, fresh							120,000	3,600	91,156	2,457
Shad, fresh							41,400	1,616	6,000	180
Shad, salted							26,000	780		
Spanish mack'l, fresh			20,000	1,600						
Swordfish, fresh			105,558	5,135			3,400	170	9,100	344
Swordfish, salted			4,800	250						
Miscellaneous, salted			54,200	696						
Lobsters			1,500	60	36,000	1,575			13,500	666
Clams (soft)							6,400	614		
Halibut fins			62,000	2,754						
Sounds			22,411	672	287	8	1,213	36	11,189	335
Tongues			205,952	4,119	6,909	138	1,068	21	7,706	154
Oil, fish			1,373,360	49,441	38,302	1,378	44,625	1,606	335,019	12,060
Oil, whale									48,750	4,225
Total	264,000	7,850	91,332,323	2,688,149	2,244,748	54,659	3,608,819	106,943	19,585,648	413,576

Species.	Plymouth.		Barnstable.		Nantucket.		Edgartown.		New Bedford.		Total for State.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
Alewives, salted											6,600	$66
Bluefish, fresh			24,927	$1,521	20,000	$1,600	28,427	$1,862	1,600	$128	74,954	5,111
Butter-fish, fresh											6,000	180
Cod, fresh	96,500	$1,875	5,594,012	151,441	15,000	375	10,722	362	52,300	1,771	19,413,205	475,761
Cod, salted			6,376,986	217,611	15,000	600			167,600	5,155	54,698,109	1,487,218
Cunners, fresh											80,000	1,120
Cusk, fresh			93,200	1,189							431,778	4,932
Cusk, salted											399,405	6,853
Flounders, fresh			7,600	152			3,254	65			10,854	217
Grouper, fresh											16,868	260
Haddock, fresh	94,500	1,580	6,028,281	98,174			3,200	64			33,832,526	580,723
Haddock, salted			13,000	130							697,380	9,593
Hake, fresh	1,900	20	1,325,000	13,772							4,875,506	51,445
Hake, salted											855,198	12,242
Halibut, fresh			478,256	38,851							8,913,260	611,640
Halibut, salted											974,930	48,932
Herring, fresh			1,440	6							273,390	2,334
Herring, salted			12,000	150							956,800	13,434
Mackerel, fresh	41,100	4,110	98,704	8,626	8,000	800	6,391	294	1,000	100	992,151	90,364
Mackerel, salted			1,015,600	84,246	5,000	500	14,100	1,122	105,200	7,791	4,148,100	371,153
Menhaden, fresh			1,200,000	6,000			32,000	800	60,000	150	1,629,600	8,679
Menhaden, salted											167,200	2,872
Pollock, fresh			518,100	5,340							2,937,438	30,278
Pollock, salted			451,100	6,044							1,967,421	23,448
Redsnapper, fresh											211,156	6,057
Sea bass, fresh							23,067	1,503			23,067	1,503
Scup, fresh							16,900	431	10,833	398	27,733	829
Shad, fresh			19,800	240							67,200	2,036
Shad, salted			94,800	2,522							120,800	3,302
Spanish mackerel, fresh											20,000	1,600
Swordfish, fresh			12,700	419			25,466	1,022	76,200	3,117	232,424	10,207
Swordfish, salted							2,400	84			7,200	334
Tautog, fresh			15,000	1,100					18,972	955	33,972	2,055
Miscellaneous fish, fresh			2,200	44							2,200	44
Miscellaneous fish, salted											54,200	696
Lobsters									29,225	1,535	80,225	3,836
Clams (soft)							400	50			6,800	664
Scallops					7,000	1,400	7,175	1,305	700	200	14,875	2,905
Halibut fins											62,000	2,754
Sounds			8,833	265							43,933	1,316
Tongues			28,986	579					762	15	251,383	5,026
Oil, fish			364,854	13,134					4,149	149	2,160,309	77,768
Oil, whale			504,263	42,655			161,025	14,084	5,457,480	427,560	6,171,518	488,524
Ambergris									37	7,750	37	7,750
Whalebone			1,200	84					97,068	320,031	98,268	320,115
Total	234,000	7,585	24,290,842	694,295	70,000	5,275	334,467	23,048	6,083,126	776,805	148,047,973	4,778,185

68.—Summary by customs districts of the vessel fisheries of Massachusetts in 1889.

Customs districts.	No. of vessels fishing.	Net tonnage.	Value of vessels.	Value of outfit, provisions, gear, fuel, etc.	No. and nationality of fishermen.				Value of catch.
					Americans.	British provincials.	Others.	Total.	
Newburyport	3	89.18	$4,600	$3,100	26	1	.....	27	$7,850
Gloucester	403	26,898.79	1,573,025	1,118,258	4,851	275	228	5,354	2,688,149
Salem and Beverly	13	620.56	34,800	20,587	50	12	69	131	54,659
Marblehead	23	772.01	41,375	46,705	206	10	1	217	106,943
Boston	66	3,678.29	201,820	152,137	573	66	143	782	413,576
Plymouth	2	55.85	2,400	1,525	13	.....	.....	13	7,585
Barnstable	188	11,786.22	522,250	376,515	1,327	497	471	2,295	694,295
Nantucket	16	109.65	7,000	920	32	.....	.....	32	5,275
Edgartown	20	642.78	24,900	20,310	94	16	15	125	23,048
New Bedford	80	13,330.85	630,575	489,775	739	280	765	1,784	776,805
Total	814	57,984.18	3,042,745	2,229,832	7,911	1,157	1,692	10,760	4,778,185

Customs districts.	No. of vessels transporting.	Net tonnage.	Value of vessels.	Value of outfit, provisions, fuel, etc.	No. and nationality of crew.				Value of products transported.
					Americans.	British provincials.	Others.	Total.	
Newburyport	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gloucester	4	322.12	$14,800	$1,000	22	.....	.....	22	$25,113
Salem and Beverly	.....	.....	.....	.....	.....	.....	.....	.....	.....
Marblehead	.....	.....	.....	.....	.....	.....	.....	.....	.....
Boston	2	113.92	4,500	600	10	.....	.....	10	10,300
Plymouth	.....	.....	.....	.....	.....	.....	.....	.....	.....
Barnstable	10	479.40	21,500	2,075	42	.....	.....	42	22,700
Nantucket	.....	.....	.....	.....	.....	.....	.....	.....	.....
Edgartown	2	21.07	2,400	250	4	.....	.....	4	2,390
New Bedford	4	338.61	12,400	3,500	13	.....	.....	13	102,902
Total	22	1,275.12	55,600	7,425	91	.....	.....	91	163,405

69.—Table showing by customs districts the average tonnage, value, crew, and stock of vessels employed in the fisheries of Massachusetts in 1889.

Customs districts.	Average tonnage.		Average value.		Average value of outfit and apparatus.		Average number of crew.		Average gross stock.	
	Fishing.	Transporting.	Fishing.	Transporting.	Fishing.	Transporting.	Fishing.	Transporting.	Fishing.	Transporting.*
Newburyport	29.73	.....	$1,533	.....	$1,033	.....	9	.....	$2,617	.....
Gloucester	67.24	80.53	3,903	$3,700	2,775	$250	13	6	6,670	$6,278
Salem and Beverly	47.74	.....	2,677	.....	1,584	.....	10	.....	4,205	.....
Marblehead	33.57	.....	1,799	.....	2,031	.....	9	.....	7,650	.....
Boston	55.73	56.96	3,058	2,250	2,305	300	12	5	6,266	5,150
Plymouth	27.93	.....	1,200	.....	763	.....	7	.....	3,793	.....
Barnstable	62.69	47.94	2,778	2,150	2,003	208	13	4	3,693	2,276
Nantucket	6.85	.....	438	.....	58	.....	2	.....	330	.....
Edgartown	32.14	10.54	1,245	1,200	1,016	125	6	2	1,152	1,195
New Bedford	166.64	84.65	7,870	3,100	6,122	875	22	3	9,710	25,726

* The value of products transported.

The effectiveness and importance of the different means of capture employed in the vessel fisheries of Massachusetts are indicated in the following tabulation. Although hand lines and trawl lines are the simplest and most primitive forms of apparatus, their importance greatly surpasses all other kinds combined, taking, in 1889, 130,953,508 pounds of fish, valued at $3,424,720, while the total yield by all devices was 139,158,625 pounds, worth $3,867,527. The catch in seines amounted to 6,132,816 pounds, valued at $389,154; in nets, 1,832,677 pounds, with a value of $43,112; with harpoons, 239,624 pounds, worth $10,541. The crustaceans and mollusks secured in the vessel fisheries and the products of the whale fishery are not included in the table.

70.—Table showing by apparatus and species the yield of the vessel fisheries of Massachusetts in 1889, exclusive of the molluscan, crustacean, and mammalian fisheries.

Apparatus and species.	Pounds.	Value.	Apparatus and species.	Pounds.	Value.
Lines:			Seines—continued.		
Bluefish, fresh	23,827	$1,876	Menhaden, salted	167,200	$2,872
Cod, fresh	19,180,605	472,173	Shad, fresh	67,200	2,036
Cod, salted	54,698,109	1,487,218	Shad, salted	120,800	3,302
Cusk, fresh	431,778	4,932	Spanish mackerel, fresh	20,000	1,600
Cusk, salted	399,405	6,853	Miscellaneous fish, fresh	2,200	44
Flounders, fresh	3,254	65	Miscellaneous fish, salted	54,200	696
Grouper, fresh	16,868	269			
Haddock, fresh	33,832,526	580,723	Total	6,132,816	389,154
Haddock, salted	697,380	9,593			
Hake, fresh	4,875,506	51,445	Gill nets:		
Hake, salted	855,198	12,242	Alewives, salted	6,600	66
Halibut, fresh	8,913,260	611,640	Bluefish, fresh	51,127	3,235
Halibut, salted	974,930	48,932	Butter-fish, fresh	6,000	180
Mackerel, fresh	87,375	7,745	Cod, fresh	232,600	3,588
Mackerel, salted	762,700	64,844	Cunners, fresh *	80,000	1,120
Pollock, fresh	2,937,438	30,278	Herring, fresh	273,390	2,334
Pollock, salted	1,967,421	23,448	Herring, salted	956,800	13,434
Red snapper, fresh	211,156	6,057	Mackerel, fresh	47,960	4,979
Scup, fresh	27,733	829	Mackerel, salted	178,200	14,176
Sea bass, fresh	23,067	1,503			
Tautog, fresh	33,972	2,055	Total	1,832,677	43,112
Total	130,953,508	3,424,720	Harpoons:		
			Swordfish, fresh	232,424	10,207
Seines:			Swordfish, salted	7,200	334
Flounders, fresh	7,600	152			
Mackerel, fresh	856,816	77,640	Total	239,624	10,541
Mackerel, salted	3,207,200	292,133			
Menhaden, fresh	1,629,600	8,679	Grand total	139,158,625	3,867,527

* Taken with snap nets.

Table 71 shows the number of vessels engaged in each fishery, with their tonnage, value, and crew, from which it will be seen that more vessels are employed in the mackerel fishery than in any other, although the whale fleet has the greatest tonnage, the cod vessels fishing on the eastern banks the greatest value, and the market vessels the largest number of fishermen. Only 2 vessels were engaged in the cod fishery in the Gulf of St. Lawrence and 5 in the Iceland halibut fishery.

71.—Table showing the number of vessels engaged in each fishery in Massachusetts in 1889, together with their tonnage, value, and number of crew.

Fisheries.	No. of vessels engaged.	Net tonnage.	Value of vessels.	Number and nationality of fishermen.			
				Americans.	British provincials.	Others.	Total.
Cod, on banks east of 65° west longitude	192	16,420.28	$870,322	2,131	428	296	2,855
Cod, on banks west of 65° west longitude	112	7,160.36	387,904	1,275	24	115	1,414
Cod, Gulf of St. Lawrence	2	122.05	2,800	15	11	.....	26
Halibut, on banks east of 65° west longitude	41	3,464.86	223,134	559	34	9	602
Halibut, on banks west of 65° west longitude	7	577.70	42,000	80	4	40	124
Halibut, Iceland	5	424.28	21,700	52	24	2	78
Mackerel, New England shore	256	9,917.37	501,538	2,023	227	80	2,330
Mackerel, Nova Scotia shore	2	136.90	8,000	26	.....	6	32
Mackerel, Gulf of St. Lawrence	39	3,264.55	191,242	564	25	25	614
Whale	68	14,303.55	663,400	819	323	776	1,918
Market	201	13,440.18	827,175	2,264	147	466	2,887
Shore	180	3,407.53	172,775	907	50	42	999
Herring	34	742.07	35,550	156	12	6	174
Swordfish	30	440.53	28,050	115	18	6	139
Menhaden	1	26.97	6,000	9	.....	4	13
Lobster	10	151.75	9,000	28	6	1	35
Scallop and clam	12	75.25	4,975	25	.....	.....	25

Table 72 shows a very close resemblance between the two most important fisheries, the bank cod and the market; the aggregate catch in each is practically the same, although the product of the former is somewhat more valuable. The whale fishery ranks third in point of value, and leads by a considerable amount the halibut fishery, which in turn excels the mackerel. The sixth position is held by the shore fishery, which is far in advance of all other branches not mentioned above, none of which have products worth over $16,000.

72.—Table showing by fisheries and species the yield of the vessel fisheries of Massachusetts in 1889.

Fisheries and species.	Pounds.	Value.
Bank cod:		
Cod, fresh	122,795	$2,451
Cod, salted	52,775,905	1,436,502
Cusk, salted	295,626	4,881
Haddock, fresh	6,857	139
Haddock, salted	641,099	8,948
Hake, salted	629,979	8,695
Halibut, fresh	576,626	43,642
Halibut, salted	189,999	10,205
Pollock, fresh	100,219	892
Pollock, salted	1,353,890	15,486
Halibut fins, salted	20,600	926
Total	56,713,595	1,532,767
Market:		
Cod, fresh	16,294,593	409,527
Cod, salted	169,690	4,109
Cusk, fresh	362,878	4,049
Cusk, salted	10,000	200
Grouper, fresh	16,868	269
Haddock, fresh	32,226,899	552,902
Haddock, salted	13,000	130
Hake, fresh	4,268,939	45,384
Hake, salted	12,000	132
Halibut, fresh	835,912	71,511
Pollock, fresh	2,325,369	23,382
Pollock, salted	10,000	150
Red snapper, fresh	211,156	6,057
Spanish mackerel	20,000	1,600
Swordfish, fresh	6,225	297
Total	56,783,529	1,119,699
Mackerel:		
Alewives, salted	6,600	66
Herring, fresh	8,200	82
Herring, salted	46,800	720
Mackerel, fresh	992,151	90,364
Mackerel, salted	4,148,100	371,153
Menhaden, fresh	329,600	2,129
Menhaden, salted	167,200	2,872
Shad, fresh	67,200	2,036
Shad, salted	120,800	3,302
Swordfish, fresh	6,150	235
Swordfish, salted	1,800	100
Miscellaneous fish, salted	54,200	696
Total	5,948,801	473,755
Shore:		
Bluefish, fresh	74,954	5,111
Butter-fish, fresh	6,000	180
Cod, fresh	2,944,331	62,553
Cod, salted	1,615,504	43,138
Cunners, fresh	80,000	1,120
Cusk, fresh	56,900	696
Cusk, salted	89,864	1,703
Flounders, fresh	10,854	217
Haddock, fresh	1,589,770	27,522
Haddock, salted	41,281	475
Hake, fresh	596,567	5,961
Hake, salted	194,274	3,132
Halibut, fresh	100,373	6,434
Shore—continued.		
Herring, fresh	1,440	$6
Menhaden, fresh	80,000	450
Pollock, fresh	511,850	6,004
Pollock, salted	601,531	7,782
Scup, fresh	27,733	829
Sea bass, fresh	23,067	1,503
Swordfish, fresh	5,891	273
Tautog, fresh	33,972	2,055
Miscellaneous fish, fresh	2,200	44
Total	8,688,356	177,188
Halibut:		
Cod, fresh	51,486	1,230
Cod, salted	137,010	3,469
Cusk, fresh	12,000	187
Cusk, salted	3,915	69
Haddock, fresh	9,000	160
Haddock, salted	2,000	40
Hake, fresh	10,000	100
Hake, salted	18,945	283
Halibut, fresh	7,400,349	490,053
Halibut, salted	784,931	38,727
Pollock, salted	2,000	30
Halibut fins, salted	41,400	1,828
Total	8,473,036	536,176
Herring:		
Herring, fresh	263,750	2,246
Herring, salted	910,000	12,714
Menhaden, fresh	20,000	100
Total	1,193,750	15,060
Swordfish:		
Swordfish, fresh	214,158	9,402
Swordfish, salted	5,400	234
Total	219,558	9,636
Menhaden:		
Menhaden, fresh	1,200,000	6,000
Molluscan:		
Clams (soft)	6,800	664
Scallops	14,875	2,905
Total	21,675	3,569
Crustacean:		
Lobsters	80,225	3,836
Whale:		
Whale oil	6,171,518	488,524
Whalebone	98,268	320,115
Ambergris	37	7,750
Total	6,269,823	816,389
Grand total	145,592,348	4,694,075

The catch of mackerel, bank cod, and bank halibut is classified by fishing-grounds in the following table. The yield of mackerel by each kind of apparatus is also specified. The figures are interesting as showing the importance of some of the principal grounds resorted to by American fishing vessels.

73.—Table showing by fishing-grounds the catch of the mackerel (by apparatus), the bank cod, the Grand and Western bank fresh halibut, and the Iceland halibut fleets of Massachusetts in 1889.

Species.	New England shore.		Nova Scotia shore.		Gulf of St. Lawrence.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Mackerel, caught with seines, fresh	856,816	$77,640				
Mackerel, caught with seines, salted	2,206,400	197,240	8,200	$603	992,600	$94,290
Mackerel, caught with nets, fresh	47,960	4,979				
Mackerel, caught with nets, salted	178,200	14,176				
Mackerel, caught with lines, fresh	87,375	7,745				
Mackerel, caught with lines, salted	752,700	63,782			10,000	1,062
Cod, salted					239,500	9,608
Total	4,129,451	365,562	8,200	603	1,242,100	104,960

Species.	East of 65° W. longitude.		West of 65° W. longitude.		Iceland.		Total.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Mackerel, caught with seines, fresh							856,816	$77,640
Mackerel, caught with seines, salted							3,207,200	292,133
Mackerel, caught with nets, fresh							47,960	4,979
Mackerel, caught with nets, salted							178,200	14,176
Mackerel, caught with lines, fresh							87,375	7,745
Mackerel, caught with lines, salted							762,700	64,844
Cod, salted	35,734,380	$981,910	16,939,035	$448,453			52,912,915	1,439,971
Halibut, fresh	7,166,861	469,179	810,108	64,494			7,976,969	533,673
Halibut, salted	176,571	8,887			746,883	$37,092	923,454	45,979
Total	43,077,812	1,459,976	17,749,143	512,947	746,883	37,092	66,953,589	2,481,140

THE SHORE FISHERIES.

The shore fisheries of Massachusetts yield a smaller percentage of the value of its total fishery products than in any other New England State; nevertheless, the State is second only to Maine in this respect, surpassing in importance the combined value of the shore fisheries of the three remaining coast States. The special features which give prominence in this branch are the pound net, lobster, and molluscan fisheries.

The extent to which the citizens of each of the eight coastal counties of Massachusetts engaged in the shore and boat fisheries in 1889 is set forth in the following series of tables, the first of which relates to persons engaged, the second to the boats and apparatus used, and the third to the quantity and value of products taken.

From the first table it is seen that Barnstable County occupies a very prominent position in the shore fisheries, for, of the 3,748 shore fishermen in the State, no less than 1,840 are credited to that county. Plymouth, the county with the least important vessel fisheries, ranks second in number of shore fishermen, having 575, while Essex County, with 5,751 vessel fishermen, ranks third, with only 454 shore fishermen.

Barnstable County is equally prominent in the quantity and value of boats and apparatus used in the shore fisheries. The total investment in the State was $567,220, of which $295,074 was the value of boats and apparatus owned in Barnstable County.* Plymouth County had $90,528 invested, Dukes County $56,632, Essex County $51,391, and Bristol County $44,799; each of the remaining counties had property worth less than $15,000. The 3,494 boats used in the shore fisheries were worth $254,033 and were, naturally, the most prominent single item of expense. Of apparatus, pound nets and trap nets were the most important. The number set in 1889 was 224, valued at $222,583, of which 97, worth $156,332, were owned in Barnstable County. Pots and gill nets are the only remaining forms of apparatus having a high value and deserving special mention; of the former, 27,294 were used, worth $38,697, and of the latter, 3,128, valued at $32,753.

The shore fisheries in 1889 yielded 151,169,696 pounds, for which the fishermen received $1,080,089. More than a third of this quantity, viz, 54,254,926 pounds, and more than two-fifths of the value, viz, $412,604, represented the fisheries of Barnstable County. The next important counties were Essex, 7,342,524 pounds, $174,660; Dukes, 26,194,734 pounds, $135,209; Plymouth, 14,665,573 pounds, $129,423; and Bristol, 38,387,976 pounds, $109,584.

The lobster is the most valuable single species taken in the shore fisheries of the State; 3,273,562 pounds were caught in 1889, the price of which was $144,656. The lobster fishery is the most extensive in Essex, Suffolk, and Plymouth counties, but it is somewhat important in all the other counties except Norfolk.

The soft clam (*Mya arenaria*) is the next important species obtained by the shore fishermen of Massachusetts; a small percentage of the catch is salted for bait, but most of the clams are marketed in a fresh condition. In 1889 the aggregate output of fresh and salt clams was 2,511,430 pounds, equivalent to about 240,151 bushels, for which the fishermen received $137,047. More than half the yield was taken in Essex County.

The catch of fresh and salt mackerel amounted to 1,546,944 pounds, valued at $123,074. By far the largest part of this was taken in Barnstable County. Essex is the only other county having a shore mackerel fishery of any extent. Mackerel is the most valuable fish in the shore fisheries of Massachusetts, and is third in value among fishery products, being surpassed by the two invertebrates already mentioned.

Scup is the next important species, 2,473,432 pounds being secured, returning the fishermen $81,824. The principal catch is made in Dukes and Barnstable counties.

Herring is the most abundant species taken in this fishery; 8,701,188 pounds of fresh and salt fish, valued at $74,994, were landed in 1889. It is extensively utilized for bait. Although the herring is captured in every coast county but Nantucket, the fishery may be said to be confined to Barnstable, Essex, and Suffolk counties.

Algæ, sea weeds, or sea mosses are the next most valuable products of the Massachusetts shore fisheries. No less than 117,993,900 pounds, or 58,997 tons, worth $66,034, were utilized, mostly in Plymouth, Barnstable, Dukes, and Bristol counties. The gathering and preparation of Irish moss is an industry of some consequence, and one which will probably increase.

* A notable innovation of recent years is the employment in Barnstable County of steam pound-net boats, sturdy steam launches about 30 feet long, built expressly for the purpose.

The temporary planting of oysters at Boston for a short time during the warm season has not been considered here, since it can not be regarded as a fishery, but it is shown in Table 85.

74.—Table showing by counties the number of men employed in the shore fisheries of Massachusetts in 1889.

Counties.	Number.
Essex	454
Suffolk	160
Norfolk	75
Plymouth	575
Barnstable	1,840
Nantucket	81
Dukes	256
Bristol	307
Total	3,748

75.—Table showing by counties the apparatus employed in the shore fisheries of Massachusetts in 1889.

Designation.	Essex.		Suffolk.		Norfolk.		Plymouth.	
	No.	Value.	No.	Value.	No.	Value.	No.	Value.
Boats	419	$13,915	145	$7,490	51	$3,097	731	$60,166
Pound nets and trap nets	26	20,375	.....	.....	.....	.....	5	3,475
Seines	5	480	.....	.....	.....	.....	7	315
Gill nets	663	6,641	75	750	15	180	302	5,119
Fyke nets	1	10	.....	.....	.....	.....	.....	.....
Snap nets and dip nets	35	116	87	243	.....	.....	104	285
Trammel nets	.....	.....	.....	.....	2	34	2	36
Trawl and hand lines	.....	1,528	.....	.....	.....	2	.....	179
Pots	4,375	5,896	5,754	5,889	997	1,745	9,288	17,263
Harpoons and spears	.....	.....	.....	.....	.....	.....	.....	30
Dredges, tongs, and rakes	.....	2,430	.....	39	.....	.....	.....	3,660
Total	.....	51,391	.....	14,411	.....	5,058	.....	90,528

Designation.	Barnstable.		Nantucket.		Dukes.		Bristol.		Total.	
	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.
Boats	1,329	$112,875	97	$3,030	332	$27,216	390	$26,244	3,494	$254,033
Pound nets and trap nets	97	156,332	.....	.....	48	27,208	48	15,193	224	222,583
Seines	28	1,625	17	1,750	1	75	.....	.....	58	4,245
Gill nets	1,641	15,756	289	3,547	65	515	18	245	3,128	32,753
Fyke nets	2	20	.....	.....	.....	.....	12	70	15	100
Snap nets and dip nets	288	347	.....	.....	.....	.....	.....	.....	514	991
Trammel nets	.....	.....	.....	.....	.....	.....	.....	.....	4	70
Trawl and hand lines	.....	1,526	.....	250	.....	77	.....	208	.....	3,770
Pots	3,568	4,131	500	500	1,245	1,541	1,567	1,732	27,294	38,697
Harpoons and spears	.....	224	.....	.....	.....	.....	.....	315	.....	569
Dredges, tongs, and rakes	.....	2,238	.....	250	.....	.....	.....	792	.....	9,409
Total	.....	295,074	.....	9,327	.....	56,632	.....	44,799	.....	567,220

76.—Table showing by counties and species the yield of the shore fisheries of Massachusetts in 1889.

Species.	Essex.		Suffolk.		Norfolk.		Plymouth.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Albacore, fresh	.....	.....	.....	.....	.....	.....	1,200	$15
Alewives, fresh	105,732	$926	.....	.....	.....	.....	266,979	3,400
Alewives, salted	.....	.....	.....	.....	.....	.....	172,750	3,264
Bluefish, fresh	100	10	.....	.....	.....	.....	84,203	7,704
Bonito, fresh	78	2	.....	.....	.....	.....	365	30
Butter-fish, fresh	62,109	1,498	.....	.....	535	$64	10,340	336
Cod, fresh	745,200	16,279	.....	.....	.....	.....	154,723	3,132
Cod, salted	700	16	.....	.....	.....	.....	.....	.....
Cunners, fresh	74,050	2,539	212,000	$10,600	5,590	280	40,755	2,914
Eels, fresh	17,500	1,280	59,340	4,747	.....	.....	13,860	918
Flounders, fresh	11,254	266	.....	.....	.....	.....	1,947	43
Haddock, fresh	364,900	6,801	.....	.....	.....	.....	80,611	1,349
Hake, fresh	452,800	3,395	.....	.....	.....	.....	.....	.....
Halibut, fresh	.....	.....	.....	.....	.....	.....	200	14
Herring, fresh	2,356,860	19,056	50,000	750	.....	.....	44,000	120
Herring, salted	265,200	3,217	640,000	6,400	1,700	34	21,000	187
Kingfish, fresh	.....	.....	.....	.....	.....	.....	816	45
Mackerel, fresh	132,792	10,974	.....	.....	650	45	43,300	4,878
Mackerel, salted	4,200	373	.....	.....	.....	.....	11,700	914

76.—Table showing by counties and species the yield of the shore fisheries of Massachusetts in 1889—Cont'd.

Species.	Essex.		Suffolk.		Norfolk.		Plymouth.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Menhaden, fresh	389,200	$3,046					38,606	$140
Menhaden, salted	3,000	72						
Pollock, fresh	144,000	1,503						
Salmon, fresh	15	4						
Scup, fresh							34,806	1,977
Sea bass, fresh	37	5					47,100	2,785
Shad, fresh	548	23					3,527	102
Spanish mackerel, fresh							176	64
Smelt, fresh	4,000	450					1,700	102
Squeteague, fresh							2,390	141
Striped bass, fresh							119	19
Sturgeon, fresh							600	21
Tautog, fresh							48,843	2,759
Whiting, fresh	2,500	40					1,005	10
Miscellaneous fish, fresh	3,336	55						
Refuse fish, fresh	9,000	63					30,000	30
Squid, fresh	2,800	34						
Lobsters, fresh	541,413	31,298	678,150	$36,086			1,262,628	45,694
Clams (soft), fresh	1,238,600	70,860	542,540	25,181			272,000	17,299
Quahogs, fresh							24,288	2,752
Scallops, fresh							23,650	5,169
Oysters							55,272	12,062
Algæ	410,000	575			3,525,490	$7,127	11,870,114	9,034
Total	7,342,524	174,660	2,182,030	83,764	3,533,965	7,550	14,665,573	129,423

Species.	Barnstable.		Nantucket.		Dukes.		Bristol.		Total for State.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Albacore, fresh	73,500	$276							74,700	$291
Alewives, fresh	1,147,580	17,096			28,100	$370	484,300	$7,381	2,032,691	29,173
Alewives, salted	1,072,600	18,952							1,245,350	22,216
Bluefish, fresh	175,199	15,561	20,954	$1,676	17,514	1,633	24,043	2,091	322,013	28,675
Bonito, fresh	27,932	827			163,008	7,180	2,683	118	194,066	8,157
Bonito, salted	1,400	88							1,400	88
Butter-fish, fresh	194,557	5,953			285,300	9,743	203,597	5,334	756,438	22,928
Cod, fresh	659,710	9,889	10,000	250	3,200	158	119,675	2,397	1,692,508	32,105
Cod, salted	371,270	13,123	103,209	2,785	63,000	1,890			538,179	17,814
Cunners, fresh	15,700	1,335							348,095	17,668
Eels, fresh	235,575	13,008	20,000	1,000	45,000	1,500	33,433	1,842	424,708	24,295
Flounders, fresh	215,392	3,871	12,460	249	236,330	6,637	469,536	9,683	946,919	20,749
Frostfish, fresh	666	20					4,207	93	4,873	113
Haddock, fresh	330,000	3,300							775,511	11,450
Hake, fresh	170,000	850							622,800	4,245
Halibut, fresh									200	14
Herring, fresh	4,964,565	41,378			219,663	2,404	12,000	180	7,647,088	63,888
Herring, salted	126,200	1,268							1,054,100	11,106
Hickory shad, fresh	5,940	111			2,700	108			8,640	219
Kingfish, fresh	600	44			484	67	2,341	197	4,241	353
Mackerel, fresh	1,086,009	79,122	12,000	1,200	27,006	2,473	11,120	1,018	1,312,877	99,710
Mackerel, salted	194,400	20,183	6,670	667	3,200	288	13,897	939	234,067	23,364
Menhaden, fresh	126,930	644			1,200	10	18,400	137	574,336	3,977
Menhaden, salted									3,600	72
Pollock, fresh	11,000	120							155,000	1,623
Pollock, salted	9,380	109							9,380	109
Salmon, fresh	124	62							139	66
Scup, fresh	820,070	26,359	2,500	100	1,182,533	40,788	433,523	12,600	2,473,432	81,824
Sea bass, fresh	200,838	13,830	71,733	5,210	410,396	30,432	60,913	3,030	791,017	55,292
Shad, fresh	39,000	1,767			330	23	119	11	43,524	1,926
Shad, salted	2,800	104							2,800	104
Spanish mack'l, fresh	1,973	493			232	60	1,080	256	3,461	873
Smelt, fresh	3,000	346					2,000	200	10,700	1,098
Squeteague, fresh	75,091	2,604			98,420	5,731	40,670	2,453	216,571	10,929
Striped bass, fresh	6,171	806			3,880	456	14,708	1,388	24,878	2,669
Sturgeon, fresh	2,200	111							2,800	132
Swordfish, fresh							15,400	843	15,400	843
Tautog, fresh	73,325	2,394			36,037	1,241	454,188	15,916	612,393	22,310
Whiting, fresh	24,000	310					86,944	1,039	114,449	1,399
Miscellaneous, fresh	180	15			851	40			4,367	110
Refuse fish, fresh	474,000	438	200,000	100			311,400	462	1,024,400	1,093
Squid, fresh	565,000	4,432							567,800	4,466
Shrimp, fresh	2,365	860							2,365	860
Lobsters, fresh	199,297	8,354	44,675	2,234	312,300	10,129	235,099	10,861	3,273,562	144,656
Clams (soft), fresh	170,370	8,903	5,000	400			8,000	640	2,236,510	123,283
Clams (soft), salted	274,920	13,764							274,920	13,764
Quahogs, fresh	19,216	1,799	4,600	460	1,600	130	85,600	7,408	135,304	12,549
Scallops, fresh	32,500	8,475	18,357	3,820			27,850	6,405	102,357	23,869
Oysters	203,595	53,476							258,867	65,538
Algæ	39,848,786	15,774	4,075,810	7,144	23,052,450	11,718	35,211,250	14,662	117,993,900	66,034
Total	54,254,926	412,604	4,607,968	27,295	26,194,734	135,209	38,387,976	109,584	151,169,696	1,080,089

The effectiveness of the different means of capture employed in the shore fisheries is exhibited in considerable detail in the following table. Regarding fish proper, it is seen that pound nets and trap nets take by far the largest quantities of products and yield the greatest money returns. In 1889, 14,633,315 pounds, worth $328,386, were thus secured. Of the fish caught in this way, the mackerel is the most valuable, although herring and scup are taken in greater abundance. Hand lines and trawl lines rank second in the quantity and value of catch; they took 4,433,812 pounds, for which $109,245 was received. Cod is the most important species as regards both quantity and value secured by this means. Gill nets were used for the capture of 3,319,158 pounds, worth $95,964. Herring are the most abundant and mackerel the most valuable fish thus taken. The catch in pots, omitting the lobster, is unimportant, but including that crustacean is greater in value than that with lines and considerably larger than that with gill nets.

77.—Table showing by counties and apparatus the yield of the shore fisheries of Massachusetts in 1889.

Apparatus and species.	Essex.		Suffolk.		Norfolk.		Plymouth.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Pound nets and trap nets:								
Albacore, fresh							1,200	$15
Alewives, fresh	41,652	$406					9,176	140
Alewives, salted							2,000	40
Bluefish, fresh	100	10					144	15
Bonito, fresh	78	2						
Butter-fish, fresh	62,109	1,498					6,825	179
Cod, fresh	40,500	720						
Cunners, fresh	250	7						
Eels, fresh	223	15					750	55
Flounders, fresh	254	8					1,947	43
Herring, fresh	1,552,460	11,273					40,000	108
Herring, salted	73,000	730						
Kingfish, fresh							816	45
Mackerel, fresh	98,367	6,624					6,333	953
Menhaden, fresh	175,000	1,153					22,175	24
Menhaden, salted	3,600	72						
Pollock, fresh	7,000	61						
Pollock, salted	15	4						
Salmon, fresh							1,560	48
Scup, fresh	37	5						
Sea bass, fresh	548	23						
Shad, fresh							41	19
Spanish mackerel, fresh							609	49
Squeteague, fresh							55	6
Striped bass, fresh							600	21
Sturgeon, fresh							1,465	131
Tautog, fresh	2,500	40					1,005	10
Whiting, fresh	3,336	55						
Miscellaneous fish, fresh							30,000	30
Refuse fish, fresh								
Total	2,061,029	22,706					126,701	1,931
Gill nets:								
Bluefish, fresh							17,089	1,662
Bonito, fresh							365	30
Butter-fish, fresh					235	$28	3,515	157
Cod, fresh	6,000	120						
Cunners, fresh					5,590	280		
Flounders, fresh	6,000	120						
Herring, fresh	491,200	5,158	50,000	$750			4,000	12
Herring, salted	192,200	2,487	640,000	6,400	1,200	24	21,000	187
Mackerel, fresh	32,675	4,250			450	30	10,950	1,129
Mackerel, salted							4,700	378
Menhaden, fresh	96,000	960					8,931	69
Scup fresh							867	32
Shad, fresh							3,527	102
Spanish mackerel, fresh							135	45
Smelt, fresh							1,700	102
Squeteague, fresh							1,781	92
Striped bass, fresh							64	13
Tautog, fresh							445	37
Total	824,075	13,095	690,000	7,150	7,475	362	79,069	4,047

77.—Table showing by counties and apparatus the yield of the shore fisheries of Massachusetts in 1889—Cont'd.

Apparatus and species.	Essex.		Suffolk.		Norfolk.		Plymouth.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Seines:								
Alewives, fresh	64,080	$520					12,250	$62
Alewives, salted							80,800	1,810
Herring, fresh	7,200	75						
Mackerel, salted	4,200	373						
Menhaden, fresh	118,200	933					7,500	47
Refuse fish, fresh	9,000	63						
Total	202,680	1,964					100,550	1,919
Fyke nets:								
Flounders, fresh	500	$10						
Trammel nets:								
Alewives, fresh							9,268	$93
Butter-fish, fresh					300	$36		
Cunners, fresh							1,250	63
Herring, salted					500	10		
Total					800	46	10,518	156
Snap nets, dip nets, etc.:								
Alewives, fresh							236,285	3,105
Alewives, salted							89,950	1,414
Cunners, fresh	45,800	1,622	212,000	$10,600			9,000	630
Eels, fresh			59,340	4,747				
Herring, fresh	306,000	2,550						
Total	351,800	4,172	271,340	15,347			335,235	5,149
Trawl lines and hand lines:								
Bluefish, fresh							66,970	6,027
Cod, fresh	698,700	15,439					154,723	3,132
Cod, salted	700	16						
Cunners, fresh							30,505	2,221
Flounders, fresh	4,500	128						
Haddock, fresh	364,900	6,801					80,611	1,349
Hake, fresh	452,800	3,395						
Halibut, fresh							200	14
Mackerel, fresh	1,750	100			200	15	26,017	2,796
Mackerel, salted							7,000	536
Pollock, fresh	137,000	1,442						
Scup, fresh							32,379	1,897
Sea bass, fresh							47,100	2,785
Smelt, fresh	4,000	450						
Tautog, fresh							46,933	2,591
Total	1,664,350	27,771			200	15	492,438	23,348
Pots:								
Cunners, fresh	28,000	910						
Eels, fresh	17,277	1,265					8,000	500
Lobsters, fresh	541,413	31,298	678,150	36,086			1,262,628	45,694
Total	586,690	33,473	678,150	36,086			1,270,628	46,194
Harpoons and spears:								
Eels, fresh							5,110	363
Miscellaneous:								
Clams (soft), fresh	1,238,600	70,860	542,540	25,181			272,000	17,299
Quahogs							24,288	2,752
Oysters							55,272	12,062
Scallops							23,650	5,169
Squid	2,800	34						
Algæ	410,000	575			3,525,490	7,127	11,870,114	9,034
Total	1,651,400	71,469	542,540	25,181	3,525,490	7,127	12,245,324	46,316
Grand total	7,342,524	174,660	2,182,030	83,764	3,533,965	7,550	14,665,573	129,423

77.—*Table showing by counties and apparatus the yield of the shore fisheries of Massachusetts in 1889*—Cont'd.

Apparatus and species.	Barnstable.		Nantucket.		Dukes.		Bristol.		Total for State.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Pound nets and trap nets:										
Albacore, fresh	73,500	$276							74,700	$291
Alewives, fresh	367,680	5,025			28,100	$370	484,300	$7,381	930,908	13,322
Alewives, salted	45,000	750							47,000	790
Bluefish, fresh	33,134	3,116			15,304	1,416	14,031	1,095	62,713	5,652
Bonito, fresh	25,870	731			163,008	7,180	2,683	118	191,639	8,031
Bonito, salted	1,400	88							1,400	88
Butter-fish, fresh	188,680	5,769			264,765	7,947	175,695	4,329	698,074	19,722
Cod, fresh	61,475	1,032			400	16	175	7	102,550	1,775
Cunners, fresh									250	7
Eels, fresh	5,600	325			7,000	360	11,021	391	24,594	1,146
Flounders, fresh	84 530	1,437			184,906	5,104	249,111	5,191	520,748	11,783
Frostfish, fresh							4,207	93	4,207	93
Herring, fresh	4,524,665	40,008			219,663	2,404			6,336,788	53,793
Herring, salted	126,200	1,268							199,200	1,998
Hickory shad, fresh	5,940	111			2,700	108			8,640	219
Kingfish, fresh	600	44			484	67	2,341	197	4,241	353
Mackerel, fresh	991,785	71,406			19,841	1,676	7,660	638	1,123,986	81,297
Mackerel, salted	133,640	10,774			3,200	288			136,840	11,062
Menhaden, fresh	117,030	588			1,200	10	18,400	137	333,805	1,912
Menhaden, salted									3,600	72
Pollock, fresh	11,000	120							18,000	181
Pollock, salted	330	9							330	9
Salmon, fresh	124	62							139	66
Scup, fresh	753,081	23,313			1,146,658	33,818	123,758	3,309	2,025,057	60,488
Sea bass, fresh	86,408	6,290			361,636	26,526	12,893	638	460,974	33,459
Shad, fresh	38,900	1,759			330	23			39,778	1,805
Shad, salted	2,800	104							2,800	104
Spanish mackerel, fresh	1,925	481			232	60	1,057	246	3,255	806
Smelt, fresh	3,000	346							3,000	346
Squeteague, fresh	69,997	2,227			98,420	5,731	32,000	1,916	201,026	9,923
Striped bass, fresh	1,567	166			3,880	456	4,358	333	9,860	961
Sturgeon, fresh	2,200	111							2,800	132
Tautog, fresh	42,835	1,383			24,412	881	67,418	1,969	136,130	4,364
Whiting, fresh	24,000	310					81,080	968	108,585	1,328
Miscellaneous fish, fresh					851	40			4,187	95
Refuse fish, fresh	474,000	438					307,511	445	811,511	913
Total	8,298,896	179,867			2,546,990	94,481	1,599,699	29,401	14,633,315	328,386
Seines:										
Alewives, fresh									76,330	582
Alewives, salted	541,000	8,049							622,400	9,859
Flounders, fresh	3,410	58	12,460	$249	51,424	1,533			67,294	1,840
Herring, fresh	39,000	119							46,200	194
Mackerel, salted									4,200	373
Menhaden, fresh									125,700	980
Scup, fresh					15,000	2,875			15,000	2,875
Miscellaneous fish, fresh	180	15							180	15
Refuse fish, fresh									9,000	63
Total	584,190	8,241	12,460	249	66,424	4,408			966,304	16,781
Gill nets:										
Bluefish, fresh	118,175	10,124			2,210	217	10,012	996	147,486	12,999
Bonito, fresh	2,062	96							2,427	126
Butter-fish, fresh	3,227	102			20,535	1,796	27,902	1,005	55,414	3,088
Cod, fresh	300	18							6,300	138
Cunners, fresh									5,590	280
Flounders, fresh									6,000	120
Herring, fresh	400,900	1,251					12,000	180	958,100	7,351
Herring, salted									854,400	9,098
Mackerel, fresh	85,810	7,028	12,000	1,200	5,750	615	2,760	310	150,395	14,562
Mackerel, salted	60,760	9,409	6,670	667			13,597	918	85,727	11,372
Menhaden, fresh	9,900	56							114,831	1,085
Scup, fresh	21,200	1,272	2,500	100	20,875	4,095	280,300	8,447	325,742	13,946
Sea bass, fresh	56,560	4,768			48,760	3,906	48,020	2,392	153,340	11,066
Shad, fresh	100	8					119	11	3,746	121
Spanish mackerel fresh	48	12					23	10	206	67
Smelt, fresh									1,700	102
Squeteague, fresh	5,094	377					8,670	537	15,545	1,006
Striped bass, fresh	4,604	640					10,350	1,055	15,018	1,708
Tautog, fresh					6,925	219	200,068	7,285	207,438	7,541
Whiting, fresh							5,864	71	5,864	71
Refuse fish, fresh			200,000	100			3,889	17	203,889	117
Total	768,740	35,161	221,170	2,067	105,055	10,848	623,574	23,234	3,319,158	95,964

77.—Table showing by counties and apparatus the yield of the shore fisheries of Massachusetts in 1889—Cont'd.

Apparatus and species.	Barnstable.		Nantucket.		Dukes.		Bristol.		Total for State.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Fyke nets:										
Butter-fish, fresh	2,650	$82							2,650	$82
Cunners, fresh	2,340	210							2,340	210
Flounders, fresh							9,700	$254	10,200	264
Scup, fresh							29,465	844	29,465	844
Total	4,990	292					39,165	1,098	44,655	1,400
Trammel nets:										
Alewives, fresh									9,268	93
Butter-fish, fresh									300	36
Cunners, fresh									1,250	63
Herring, salted									500	10
Total									11,318	202
Snap nets, dip nets etc.:										
Alewives, fresh	779,900	12,071							1,016,185	15,176
Alewives, salted	486,000	10,153							575,950	11,567
Cunners, fresh									266,800	12,852
Eels, fresh									59,340	4,747
Herring, fresh									306,000	2,550
Total	1,265,900	22,224							2,224,275	46,892
Trawl lines and hand lines:										
Bluefish, fresh	23,890	2,321	20,954	$1,676					111,814	10,024
Cod, fresh	597,935	8,839	10,000	250	2,800	$142	119,500	2,390	1,583,658	30,192
Cod, salted	371,270	13,123	103,209	2,785	63,000	1,890			538,179	17,814
Cunners, fresh	13,360	1,125							43,865	3,346
Flounders, fresh	25,352	431					5,725	138	35,577	697
Frostfish, fresh	666	20							666	20
Haddock, fresh	330,000	3,300							775,511	11,450
Hake, fresh	170,000	850							622,800	4,245
Halibut, fresh									200	14
Mackerel, fresh	8,414	688			1,415	182	700	70	38,496	3,851
Mackerel, salted							300	21	7,300	557
Pollock, fresh									137,000	1,442
Pollock, salted	9,050	100							9,050	100
Scup, fresh	45,789	1,774							78,168	3,671
Sea bass, fresh	57,870	2,772	71,733	5,210					176,703	10,767
Smelt, fresh							2,000	200	6,000	650
Tautog, fresh	30,490	1,011			4,700	141	186,702	6,662	268,825	10,405
Total	1,684,086	36,354	205,896	9,021	71,915	2,355	314,927	9,481	4,433,812	109,245
Pots:										
Cunners, fresh									28,000	910
Eels, fresh	180,175	9,838	20,000	1,000	38,000	1,140	12,012	811	275,464	14,554
Lobsters, fresh	199,297	8,354	44,675	2,234	312,300	10,129	235,099	10,861	3,273,562	144,656
Total	379,472	18,192	64,675	3,234	350,300	11,269	247,111	11,672	3,577,026	160,120
Harpoons and spears:										
Eels, fresh	49,800	2,845					10,400	640	65,310	3,848
Flounders, fresh	102,100	1,945					205,000	4,100	307,100	6,045
Swordfish, fresh							15,400	843	15,400	843
Total	151,900	4,790					230,800	5,583	387,810	10,736
Miscellaneous:										
Clams (soft), fresh	170,370	8,903	5,000	400			8,000	640	2,236,510	123,283
Clams (soft), salt'd	274,920	13,764							274,920	13,764
Quahogs	19,216	1,799	4,600	460	1,600	130	85,600	7,408	135,304	12,549
Oysters	203,595	53,476							258,867	65,538
Scallops	32,500	8,475	18,357	3,820			27,850	6,405	102,357	23,869
Shrimp	2,365	860							2,365	860
Squid	565,000	4,432							567,800	4,466
Algæ	39,848,786	15,774	4,075,810	7,144	23,052,450	11,718	35,211,250	14,662	117,993,900	66,034
Total	41,116,752	107,483	4,103,767	11,824	23,054,050	11,848	35,332,700	29,115	121,572,023	310,363
Grand total	54,254,926	412,604	4,607,968	27,295	26,194,734	135,209	38,387,976	109,584	151,169,696	1,080,089

The following table graphically exhibits the relative importance of the various means of capture employed in the shore fisheries of Massachusetts. The table shows the wide differences which exist between the percentages of quantity and value of products obtained in the different forms of apparatus.

78.—Table showing the relative quantity and value of yield in each principal form of apparatus of capture employed in the shore fisheries of Massachusetts in 1889.

Apparatus.	Percentage.	
	Quantity.	Value.
Seines	.64	1.55
Gill nets	2.19	8.89
Pound nets and trap nets	9.68	30.40
Fyke nets	.03	.13
Snap nets and dip nets	1.47	4.34
Hand and trawl lines	2.93	10.12
Pots	2.37	14.83
Harpoons and spears	.26	.99
Miscellaneous	80.43	28.75
Total	100.00	100.00

The various counties fare very differently in the item of receipts from the sale of fishery products. This fact is brought out in the following table. In Essex County, for instance, the fishermen take $1,256 worth of products for each $100 invested in boats; in Suffolk County they stock $1,117 on the same basis, while in Plymouth County only $215 is the average. The variation in the item of investment in apparatus is quite as marked. Suffolk County leads with products valued at $1,214 for each $100 expended for apparatus; Barnstable County ranks last, with only $226. The average stock per man is greatest in Dukes and Suffolk counties ($528 and $524, respectively) and least in Norfolk County ($101).

The relative effectiveness of each kind of apparatus in each county is shown. Pound nets and trap nets yield a larger percentage of returns than any other devices in Barnstable, Dukes, and Bristol counties; pots lead in Suffolk County; and such miscellaneous forms as rakes, hoes, dredges, etc., are the most important in Essex, Norfolk, Plymouth, and Nantucket counties. Seines take an insignificant part in the fisheries of all the counties, but are most important in Dukes County, where they are credited with 3 per cent of the entire value of the shore products. Gill nets are most effective in Bristol County, where they yield 21 per cent of the returns, but in no other county do they represent as much as 9 per cent of the income of the fishermen. In Suffolk County snap nets, dip nets, and other minor nets took 18 per cent of the value of the output. Lines in Nantucket, Plymouth, and Essex counties yielded, respectively, 36, 18, and 16 per cent of the returns.

79.—Table showing by counties certain averages and percentages of the shore fisheries of Massachusetts in 1889.

Counties.	Value of catch per each $100 invested in boats.	Value of catch per each $100 invested in apparatus.	Value of catch per each man employed.	Percentage of value of yield in principal forms of apparatus.									
				Total.	Pound nets and trap nets.	Seines.	Gill nets.	Fyke nets.	Snap nets, dip nets, etc.	Lines.	Pots.	Harpoons and spears.	Miscellaneous.
Essex	$1,256	$466	$385	100.00	13.00	1.12	7.50	.01	2.39	15.90	19.16	.....	40.92
Suffolk	1,117	1,214	524	100.00	.....	.....	8.54	.....	18.32	.....	43.08	.....	30.06
Norfolk	244	378	101	100.00	.....	.....	4.79	.....	.....	.20	.....	.....	95.01
Plymouth	215	426	225	100.00	1.49	1.48	3.13	.....	3.98	18.04	35.69	.28	35.91
Barnstable	365	226	224	100.00	43.59	2.00	8.52	.07	5.39	8.81	4.41	1.16	26.05
Nantucket	910	433	337	100.00	.....	.91	7.57	.....	.....	36.35	11.85	.....	43.32
Dukes	497	460	528	100.00	69.88	3.26	8.02	.....	.....	1.74	8.34	.....	8.76
Bristol	418	589	357	100.00	26.83	.....	21.20	1.00	.....	8.65	10.65	5.10	26.57

The relative value of each fishery product is shown in great detail in the next table, the specification being by counties. The figures represent the percentage of value of each product to the total value of the catch in each county.

80.—Table showing by counties the percentage of value of each species to the total yield of the shore fisheries of Massachusetts in 1889.

Species.	Essex.	Suffolk.	Norfolk.	Plymouth.	Barnstable.	Nantucket.	Dukes.	Bristol.
Albacore, fresh				.01	.07			
Alewives, fresh	.53			2.63	4.14		.27	6.74
Alewives, salted				2.52	4.59			
Bluefish, fresh	.01			5.95	3.77	6.14	1.21	1.91
Bonito, fresh				.02	.20		5.31	.11
Bonito, salted					.02			
Butter-fish, fresh	.86		.85	.26	1.44		7.20	4.87
Cod, fresh	9.32			2.42	2.40	.92	.12	2.19
Cod, salted	.01				3.18	10.20	1.40	
Cunners, fresh	1.45	12.65	3.71	2.25	.32			
Eels, fresh	.73	5.67		.71	3.15	3.66	1.11	1.68
Flounders, fresh	.15			.03	.94	.91	4.91	8.84
Frostfish or tomcod, fresh					.01			.08
Haddock, fresh	3.90			1.04	.80			
Hake, fresh	1.95				.21			
Halibut, fresh				.01				
Herring, fresh	10.91	.90		.09	10.03		1.78	.16
Herring, salted	1.84	7.64	.45	.14	.31			
Hickory shad, fresh					.03		.08	
Kingfish, fresh				.04	.01		.05	.18
Mackerel, fresh	6.28		.59	3.77	19.18	4.40	1.83	.93
Mackerel, salted	.21			.71	4.89	2.44	.21	.86
Menhaden, fresh	1.75			.11	.16		.01	.13
Menhaden, salted	.04							
Pollock, fresh	.86				.03			
Pollock, salted					.03			
Salmon, fresh					.01			
Scup, fresh				1.53	6.39	.37	30.16	11.50
Sea bass, fresh				2.15	3.35	19.09	22.51	2.77
Shad, fresh	.01			.08	.43		.02	.01
Shad, salted					.02			
Spanish mackerel, fresh				.05	.12		.04	.23
Smelt, fresh	.26			.08	.08			.18
Squeteague, fresh				.11	.63		4.24	2.24
Striped bass, fresh				.01	.19		.34	1.27
Sturgeon, fresh				.02	.03			
Swordfish, fresh								.77
Tautog, fresh				2.13	.58		.92	14.52
Whiting, fresh	.02			.01	.07			.95
Miscellaneous fish, fresh	.03				.01		.03	
Refuse fish, fresh	.04			.02	.11	.37		.42
Squid, fresh	.02				1.07			
Shrimp, fresh					.21			
Lobsters, fresh	17.92	43.08		35.31	2.02	8.18	7.49	9.91
Clams (soft), fresh	40.57	30.06		13.37	2.16	1.47		.58
Clams (soft), salted					3.34			
Quahogs, fresh				2.13	.44	1.69	.09	6.75
Scallops, fresh				3.99	2.05	13.99		5.84
Oysters				9.32	12.96			
Algæ	.33		94.40	6.98	3.82	26.17	8.67	13.38
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

The following tables show three different phases of the bait fishery prosecuted from the shores of Massachusetts. In the first table the extent and value of this fishery is shown by counties and apparatus; in the second table an exhibit is made by counties and species; and the third is a presentation by apparatus and species.

A consideration of these tables demonstrates that Barnstable County is the most important from the standpoint of production of bait, while Essex County comes next. In both of these counties, as well as in Bristol County, pound nets and trap nets are the important factors in obtaining bait; indeed, the third table shows that of the 8,592,464 pounds of fish and squid obtained in the shore fisheries of Massachusetts and sold for bait, 6,980,684 pounds were the product of the pound-net fishery; while gill nets, the next most productive form, took only 406,000 pounds.

It is noteworthy that nearly one-half of the products obtained in the pound-nets of Massachusetts are sold for bait to vessels engaged, for the most part, in the offshore-bank fisheries. To be more precise, it may be stated that the entire product of the pound-net fishery of Massachusetts amounted, in 1889, to 14,633,315 pounds, of which, as has been shown, 6,980,684 pounds were sold for bait. It is also noteworthy that the catch of the pound nets in this region shows a very small percentage of what are commonly denominated "game fish." So far as bait species are concerned, herring take precedence, 5,739,400 pounds having been sold. Squid is the next important species, 567,800 pounds having been taken for bait in pound nets in 1889; none were obtained by other forms of apparatus.

For some years Barnstable Bay, particularly on the Cape Cod side, has been a famous bait resort for vessels employed in the ocean fisheries. The importance to the bank fisheries of this resource for bait supply for vessels sailing from Cape Cod ports, Boston, and the north shore of Massachusetts Bay, will be better understood when it is stated that enough bait was obtained in 1889 in Barnstable County to supply 20 barrels each to more than 1,500 sail of vessels.

81.—Table showing by counties and apparatus the quantities of fish and squid taken in the shore fisheries of Massachusetts in 1889 and sold for bait.

Apparatus.	Essex.		Plymouth.		Barnstable.		Bristol.		Total.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Pound nets and trap nets	1,301,352	$9,460	9,176	$140	5,513,556	$42,704	156,600	$284	6,980,684	$52,588
Seines	189,480	1,528	.....	.....	.....	.....	.....	.....	189,480	1,528
Gill nets	376,000	3,449	.....	.....	30,000	375	.....	.....	406,000	3,824
Dip nets	306,000	2,550	166,500	2,237	543,800	9,008	.....	.....	1,016,300	13,795
Total	2,172,832	16,987	175,676	2,377	6,087,356	52,087	156,600	284	8,592,464	71,735

82.—Table showing by counties and species the quantities of fish and squid taken in the shore fisheries of Massachusetts in 1889 and sold for bait.

Species.	Essex.		Plymouth.		Barnstable.		Bristol.		Total.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Alewives, fresh	106,232	$926	175,676	$2,377	781,956	$12,129	.....	.....	1,063,864	$15,432
Herring, fresh	1,689,200	13,039	.....	.....	4,643,400	35,179	.....	.....	6,332,600	48,218
Menhaden, fresh	370,000	2,911	.....	.....	87,000	342	9,400	$68	466,400	3,321
Menhaden, sliversa	3,600	72	.....	.....	.....	.....	.....	.....	3,600	72
Squid, fresh	2,800	34	.....	.....	565,000	4,432	.....	.....	567,800	4,466
Miscellaneous fish, fresh	1,000	5	.....	.....	10,000	5	147,200	216	158,200	226
Total	2,172,832	16,987	175,676	2,377	6,087,356	52,087	156,600	284	8,592,464	71,735

83.—Table showing by apparatus and species the quantities of fish and squid taken in the shore fisheries of Massachusetts in 1889 and sold for bait.

Species.	Pound nets and trap nets.		Seines.		Gill nets.		Dip nets.		Total.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Alewives, fresh	259,484	$3,292	64,080	$520	30,000	$375	710,300	$11,245	1,063,864	$15,432
Herring, fresh	5,739,400	43,104	7,200	75	280,000	2,489	306,000	2,550	6,332,600	48,218
Menhaden, fresh	252,200	1,428	118,200	933	96,000	960	.....	.....	466,400	3,321
Menhaden, sliversa	3,600	72	.....	.....	.....	.....	.....	.....	3,600	72
Squid, fresh	567,800	4,466	.....	.....	.....	.....	.....	.....	567,800	4,466
Miscellaneous fish, fresh	158,200	226	.....	.....	.....	.....	.....	.....	158,200	226
Total	6,980,684	52,588	189,480	1,528	406,000	3,824	1,016,300	13,795	8,592,464	71,735

RESULTS OF ARTIFICIAL PROPAGATION.

No subject connected with the fisheries of New England seems to be of greater consequence than the results which apparently have been secured through the hatching and planting of millions of cod fry by the U. S. Fish Commission in the coastal waters of this region. When this work was first inaugurated there was much skepticism among the fishermen, who believed that little could be accomplished by man in this direction. However, much to the surprise and advantage of those most interested, young cod have made their appearance in great numbers on many parts of the coast, particularly off southern New England, where, for at least a quarter of a century, they have been either very rare or unknown; and it seems to be demonstrated that as a result of this work a new and important summer cod fishery has been established on Nantucket Shoals and on the fishing-grounds immediately south.

During the summer of 1890 the Fish Commission received information showing that up to the first of August large catches of cod of small or medium size had been made by the fleet of schooners fishing south or east of Nantucket. This fishery was begun by a few small vessels in 1889, one of which, the *Eliza*, landed about 300,000 pounds of small cod taken in the season of that year. From all the data available, at least 4,000,000 pounds of codfish appear to have been taken on these grounds in the spring and summer of 1890, previous to the last of July. These fish are reported to be much in favor in the markets, since they are of even size and in good demand at restaurants and hotels, where they are prepared for food under the name of "scrod."

Among other references to the appearance of young cod along the coast, which are concededly those hatched by the Fish Commission, is the following:

Mr. George A. Griffin, of Wakefield, Rhode Island, writing under the date of December 12, 1890, says:

> There are none of our fishermen that have made any business of cod fishing for 15 or 20 years past, so they were ill prepared to catch or cure when the fish struck on. But they managed to secure, as near as I can calculate without taking a great deal of pains, some 6,000 to 7,500 pounds of cod. The fish struck on at the pier [Narragansett Pier] the 20th of October. Capt. Taylor's boy and a friend went out in a small boat from South Pier and caught about 20 or 30 fish. The next day they caught about 100. This waked up the older fishermen and they caught from 100 to 300 fish per day to a boat according to the weather, etc. * * * They were all caught within a quarter of a mile off the pier shore and half a mile or so off Point Judith. * * * The fish would average, I think, about 6 pounds, and were of a very dark color, with once in a while a large, coarse, light-colored fish, which resembled more the common old fish we used to catch here.

The observations of Mr. Willard Nye, of New Bedford, Massachusetts, disclosed the occurrence of codfish in the shoal waters at the mouth of Buzzards Bay and to the westward in greater numbers than for many years. The fish were mostly caught in pound nets and trap nets as far west as Sakonnet Point, and numbers were also taken with hook and line in various localities. Mr. Nye states that cod fishing inside Buzzards Bay is something new, even to the oldest inhabitant, and he does not doubt that the fish secured are those artificially propagated by the U. S. Fish Commission. The fish are of fine quality, very active, and are of two sizes, weighing 4 and 6 pounds each, and are school cod and not the rock cod, specimens of which are caught every year.

THE FISH TRADES OF BOSTON AND GLOUCESTER.

A noticeable feature of the fishery interests of Massachusetts is the great volume of trade entering at Gloucester and Boston, which are the receiving and distributing centers of marine food products for New England, to such an extent that they practically control this branch of commerce. Maine has extensive canning interests and produces large quantities of salt and fresh fish, but has no very important trade center for fishing products, and the bulk of its output is marketed in Massachusetts. For this reason the tables showing the fish trade of the two leading ports of New England will throw an instructive side light upon the fisheries of this region.

Tables 84 and 85 make an exhibit of the fish trade of Gloucester and Boston. Heretofore no statistics of this nature have been prepared, and there has been no definite knowledge of the extent of the fish trade in these ports. The magnitude of the trade will probably be a matter of considerable surprise to many.

Gloucester is the leading fish-producing center of the United States; its large and fine fleet of vessels engages in all the leading branches of ocean fishery except the mammal fisheries, from the Gulf of Mexico to Iceland; and its trade is chiefly in the products received from its own vessels, though considerable quantities of fish are obtained from other New England States and from the British provinces.

Boston, while having a much smaller fleet than Gloucester, is a great distributing center of fishery products. It receives contributions from many sources. What is commonly denominated the market fishery of New England centers at Boston, where the fleets of the leading fishing ports resort to sell their catch. In addition to this, Boston imports from the British North American provinces, from various countries of Europe, and from Pacific and Atlantic ports, all kinds of fishery products. Its trade is very extensive, as will appear by the tables.

From the table showing the extent of the wholesale fish trade of Gloucester it will be seen that the handling of salt fish is the most important branch of the business. This gave employment to 833 persons; $1,769,138 was invested in shore property and cash capital, and 114,296,733 pounds of raw products, worth $3,427,966, were handled, from which 92,833,991 pounds of boneless and other kinds of cured fish, with a value of $4,193,284, were prepared. The enhancement in value is thus $765,318, this sum representing the gross profits of the trade.

The fresh-fish trade is the next in importance, although much less extensive than the preceding. The fish handled amounted to 11,671,331 pounds, valued at $491,636, and the quantity of fish sold was 10,229,994 pounds, for which $610,971 was received, the gross profits being $119,335.

The business of smoking fish utilized 3,410,205 pounds of fish, worth $127,387, which, when smoke-cured, weighed 2,259,346 pounds, with a market value of $169,266, the gross profit amounting to $41,879.

The difference between the quantities of fish bought and sold in the three foregoing trades is due to the waste in the process of curing, preparing, etc., as will be readily understood.

The trade in and manufacture of fish oil is an important feature of the fish trade of Gloucester. The table shows 8,278,513 pounds of livers, crude oil, etc., purchased for $216,077 by the 8 wholesale dealers, who manufactured and handled 912,728 gallons of oil, for which they received $283,754.

In the manufacture of glue and isinglass 23,930,925 pounds of fish sounds, fins, skins, etc., were utilized, for which $114,776 was paid. From these 5,983,420 pounds of products were obtained, having a value of $360,671, the gross profits, viz, $245,895, being proportionally greater than in any other branch, although the expenses were also proportionally larger.

84.—Table showing the extent of the wholesale fish trades and related industries of Gloucester, Mass., in 1889.

Trades.	No. of firms.	Persons engaged.				Capital invested.		Purchased.		Sold.	
		Capitalists.	Clerks.	All others.	Total.	Plants.	Cash.	Pounds.	Value.	Pounds.	Value.
Fresh fish	7	10	9	27	46	$33,000	$91,500	11,671,331	$491,636	10,229,994	$610,971
Salt fish	52	86	172	575	833	884,138	885,000	114,296,733	3,427,966	92,833,991	4,193,284
Smoked fish	6	2	.....	26	28	28,100	18,000	3,410,205	127,387	2,259,346	169,266
Canning	1	.....	.....	10	10	.....	.....	27,000	2,200	24,180	3,210
Oil	8	4	5	16	25	34,250	79,000	8,278,513	216,077	*6,845,460	283,754
Glue and isinglass manufacturing	5	28	10	74	112	176,450	140,500	23,930,925	114,776	†5,983,420	360,671
Box-making	3	2	1	33	36	55,500	20,000	.....	.....	.....	.....
Outfitting, not elsewhere enumerated	4	7	2	3	12	50,500	60,000	.....	.....	.....	.....
Ice and salt	4	4	6	23	33	201,650	80,000	.....	.....	.....	.....
Total	90	143	205	787	1,135	1,463,588	1,374,000	161,614,707	4,380,042	118,176,391	5,621,156

* 912,728 gallons. † Glue, isinglass, poultry food, and fertilizer.

In Boston, there are more firms engaging in the various wholesale branches of trade than in Gloucester, although the number of employés is less.

The fresh-fish trade, which is the most important, was represented by 44 firms, with 326 persons engaged, having $1,063,350 devoted to the business. Over 82,000,000 pounds of fresh fish were handled, for which $2,639,346 was paid and $3,165,110 received.

In the salt-fish trade 24 firms were engaged; the persons employed numbered 369; the capital invested amounted to $1,139,575. Nearly 38,000,000 pounds of fresh and salt fish passed into the hands of the firms, for which $1,632,688 was paid. For the quantity of salt fish sold without being further treated, $1,909,362 was obtained, and from the remaining portion there were prepared boneless and smoked fish, the quantity of which, together with fish that were in a smoked state when received, was 17,384,900 pounds. From the fresh fish handled, there were, in addition to those smoked, considerable quantities canned; the table shows 89,985 cases so prepared; these, together with the smoked and boneless fish, sold for $1,207,520, while the cost was $1,013,313. Owing to the intimate relations existing between the smoking and canning business and the salt-fish trade, some of the firms engaging in all these branches, it has not been practicable to show them separately in the table.

The wholesale commission trade is seen to have handled 52,350,500 pounds of fish, mostly salt-cured, for which the gross price received was $2,657,650. In the preparation of glue and isinglass 19,151,000 pounds of fish sounds, skins, and heads were utilized, the cost of which was $118,474. The resulting manufactured goods, consisting of glue, isinglass, poultry food, and fertilizer, amounted to 3,757,966 pounds, with a market value of $245,155, these figures including 14,000 pounds of isinglass valued at $7,700, which were manufactured in Maine and simply purchased and sold by a Boston firm.

The table shows that in 1889 208,000,000 pounds of fish products passed through the hands of the wholesale firms of Boston, and by the processes of handling and manufacturing the value of the products was increased by the sum of $1,431,480—the gross profits of the trade. The total fish trade of Boston, based on the value of products as sold, reaches an aggregate of $11,100,259.

85.—Table showing the extent of the wholesale fish trades of Boston, Mass., in 1889.

Trades.	No. of firms.	Persons engaged.				Wages paid in 1889.	Capital invested.		
		Capitalists.	Clerks.	All others.	Total.		Plants.	Cash.	Total.
Fresh fish	44	89	52	141	326	$136,940	$615,350	$448,000	$1,063,350
Salt fish	24	34	67	244	369	150,262	405,975	733,600	1,139,575
Oyster	14	21	16	100	151	67,086	137,875	144,500	282,375
Lobster	11	17	7	39	74	31,152	67,165	65,000	132,165
Commission	12	19	38	.....	69	31,128	71,600	765,000	836,600
Glue and isinglass	5	7	5	71	88	19,626	72,700	135,000	207,700
Total	110	187	185	595	1,077	436,194	1,370,665	2,291,100	3,661,765

Trades.	Raw products handled.			Manufactured products handled or prepared.				Enhancement in value.
	Pounds.	Price paid.	Price received.	Smoked and boneless.	Canned.	Price paid.	Price received.	
				Pounds.	*Cases.*			
Fresh fish	*82,697,368	$2,639,346	$3,165,110	.....	.....	.....	.....	$525,764
Salt fish	37,786,685	1,032,688	1,909,362	17,384,900	89,985	$1,013,313	$1,207,520	470,881
Oyster	†8,090,838	1,050,304	1,220,823	.....	.....	.....	.....	170,519
Lobster	8,213,264	557,004	694,639	.....	.....	.....	.....	137,635
Commission	52,350,500	.....	2,657,650	.....	.....	.....	.....	.....
Glue and isinglass	19,151,000	118,474	.....	‡3,757,966	.....	.....	245,155	126,681
Total	208,289,655	5,997,816	9,647,584	21,142,866	89,985	1,013,313	1,452,675	1,431,480

* In the figures for this trade the following products have not been included: 135,400 buckets of livers, cost price $8,753, selling price $14,572.

† 1,155,834 bushels.

‡ Glue, isinglass, poultry food, and fertilizer.

THE FISHING-GROUNDS.

The following table is presented to show the relative productiveness of the Atlantic fishing-grounds resorted to by vessels sailing from Gloucester, Mass., so far as this can be demonstrated from the reports obtained from vessels landing their fares at Gloucester. It may be stated at the outset, however, that the cargoes do not represent the entire catch of the Gloucester fleet, since large quantities of fish are landed elsewhere, notably at Boston. Nevertheless, the table will serve the purpose for which it has been prepared, particularly if considered in connection with Table 87, which covers receipts at Boston.

It has been deemed advisable to show under distinct headings the quantities of fish taken on the grounds on either side of the sixty-fifth meridian; those west of this meridian are for the most part off the coast of the United States; those east of it are in the open Atlantic or off the coasts of the British North American Provinces.

86.—Table showing by fishing-grounds the quantities of fish landed at Gloucester, Mass., in 1889, by New England fishing vessels.

Species.	Fishing-grounds west of 65° W. longitude.											
	Offshore grounds.						Inshore grounds.					Total.
	Nantucket Shoals.	South Channel.	Georges Bank.	Fippennies Bank.	Cashes Bank.	Browns Bank.	Shore, general.	Ipswich Bay.	Off Chatham.	Jeffreys Ledge.	Middle (or Stellwagen) Bank.	
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
Cod, fresh	51,000	6,000	373,300	.....	20,000	72,000	1,971,955	50,700	.....	.....	11,000	2,555,955
Cod, salted	1,061,700	56,100	15,464,001	.....	84,800	138,000	588,800	11,000	.....	.....	.....	17,404,401
Cusk, fresh	.....	16,000	42,000	23,600	72,000	.....	21,170	.....	.....	25,000	.....	199,770
Cusk, salted	2,000	.....	18,300	.....	52,400	.....	92,300	.....	.....	.....	.....	165,000
Haddock, fresh	.....	.....	1,147,000	.....	.....	.....	150,170	.....	.....	.....	6,300	1,303,470
Haddock, salt	.....	.....	.....	.....	.....	.....	10,000	.....	.....	.....	.....	10,000
Hake, fresh	.....	5,000	29,000	.....	10,000	.....	448,620	.....	.....	.....	.....	492,620
Hake, salted	10,000	9,600	95,900	.....	46,000	.....	194,300	.....	.....	.....	.....	355,800
Halibut, fresh	44,000	.....	945,660	.....	.....	26,600	.....	.....	.....	.....	10,400	1,026,660
Herring, salted	.....	.....	.....	.....	.....	.....	556,400	.....	.....	.....	.....	556,400
Mackerel, salted	.....	.....	.....	.....	.....	.....	1,091,600	.....	.....	.....	120,900	1,212,500
Pollock, fresh	.....	.....	.....	.....	.....	.....	855,273	.....	.....	2,240,250	.....	3,095,523
Pollock, salted	21,000	.....	15,000	.....	.....	.....	164,200	.....	310,000	.....	.....	510,200
Swordfish, fresh	.....	.....	.....	.....	.....	.....	18,840	.....	.....	.....	.....	18,840
Total	1,189,700	92,700	18,130,161	23,600	285,200	236,600	6,163,628	61,700	310,000	2,265,250	148,600	28,907,139

Species.	Fishing-grounds east of 65° W. longitude.									Grand total.
	Offshore grounds.					Inshore grounds.			Total.	
	Grand Bank and Flemish Cap.*	Western Bank.	Quereau Bank.	La Have Bank.	Iceland.	Cape Shore.	Cape North.‡	Gulf of St. Lawrence generally.		
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
Cod, fresh	3,000	5,000	34,000	.....	.....	.....	.....	.....	42,000	2,597,955
Cod, salted	22,533,997	4,285,333	137,410	189,135	.....	2,775,280	.....	.....	29,921,155	47,325,556
Cusk, fresh	.....	1,000	.....	9,000	.....	.....	.....	.....	10,000	209,770
Cusk, salted	.....	36,837	.....	26,711	.....	35,100	.....	.....	98,648	263,648
Haddock, fresh	.....	5,000	.....	2,000	.....	.....	.....	.....	7,000	1,310,470
Haddock, salted	.....	48,648	.....	57,652	.....	5,000	.....	.....	111,300	121,300
Hake, fresh	.....	2,000	.....	8,000	.....	.....	.....	.....	10,000	502,620
Hake, salted	.....	76,673	.....	125,361	.....	274,200	.....	.....	476,234	832,034
Halibut, fresh	5,002,500	1,250,528	728,208	125,660	.....	†49,350	51,000	.....	7,207,246	8,233,906
Halibut, salted	138,458	35,348	.....	.....	746,883	2,000	.....	.....	922,689	922,689
Herring, salted	.....	.....	.....	.....	.....	.....	.....	.....	.....	556,400
Mackerel, salted	.....	.....	.....	.....	.....	.....	.....	1,063,200	1,063,200	2,275,700
Pollock, fresh	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,095,523
Pollock, salted	.....	61,402	.....	159,704	.....	.....	.....	.....	221,106	731,306
Swordfish, fresh	.....	.....	.....	.....	.....	.....	.....	.....	.....	18,840
Total	27,677,955	5,807,769	899,618	703,223	746,883	3,140,930	51,000	1,063,200	40,090,578	68,997,717

* The greater part of the salt cod and all of the fresh halibut under this head were taken on the Grand Bank.

† The term "Cape Shore" is somewhat indefinitely applied to fishing-grounds along the south side of Nova Scotia, from Cape Sable (from which the term is derived) eastward, at distances generally varying from 10 to 40 miles from the land.

‡ In some seasons fares of salt cod are received from this ground, but fares of fresh halibut are very exceptional.

In explanation of this table, it may be said that the fishery on what is termed Nantucket Shoals is carried on upon grounds at varying distances south or east of Nantucket, sometimes in relatively deep water. The fishery usually begins in April and continues until September. It may be denominated a summer cod fishery.

The fishery in the South Channel is engaged in occasionally by a few vessels which at other times fish upon Georges Bank or Browns Bank. This is also a summer fishery, and depends on the fact that during midsummer fish are generally compara-

tively scarce on Georges Bank. It may be explained that the South Channel (so called) is a westward extension of Georges Bank. It divides the great shoals on the bank from Nantucket Shoals.

The Georges Bank fishery is carried on throughout the year, although the fishery is prosecuted to a less extent in January, October, November, and December than during the rest of the season. The fleet begins operations in the latter part of January or early in February. Some of the vessels haul up in November and December. Vessels employed in catching fresh haddock and cod are most active in midwinter and in the late spring and early summer. The greater part of their catch is landed at Boston.

The fishery on Cashes Bank usually begins in April and is continued until July. It is a minor fishery and is carried on chiefly by small schooners that engage in the shore fishery in winter.

Browns Bank is resorted to in the early winter and late spring and summer by the vessels that commonly fish on Georges Bank during February, March, and April, when the "winter school" of cod is on Georges.

"Shore, general," under the head of "inshore grounds," applies to various areas along the New England coast from Block Island to the Bay of Fundy. It often happens that a vessel cruising for mackerel, swordfish, or perhaps engaged in the shore cod fishery, may in one trip visit a large number of fishing-grounds, and in some cases may cover the entire region along the coast from Block Island to near Grand Manan. It has, therefore, been found necessary to make this classification.

There is a limited fishing-ground off Cape Cod which is resorted to in the spring for pollock. Ipswich Bay is a famous cod fishing-ground in winter. Large quantities of fish taken there by the Gloucester vessels are landed elsewhere, especially at Boston. It is also beyond question that many of the fresh codfish included under the head of "shore, general" were taken in Ipswich Bay.

Fippennies Bank is an unimportant fishing-ground lying westward of Cashes, and is sometimes resorted to in summer by small schooners, which seldom make more than one or two trips.

Jeffries Ledge is visited chiefly in fall by small vessels fishing for pollock.

The following explanations may be offered concerning the fishing-grounds lying east of the sixty-fifth meridian.

In November and December certain vessels which at other seasons are engaged in fishing chiefly upon Georges Bank visit La Have for fares of fresh and salt cod. The halibut credited to this bank are in part taken east of the bank, on what is termed the La Have Ridges.

The Western Bank cod fishery is usually prosecuted most extensively in March, April, and May, though it is engaged in to a less extent in the fall and early winter. The cod-fishing vessels ordinarily sail in March, and the last of them arrive home in June. Vessels visiting the bank in fall sail in September, October, and November. The quantity of fish taken on the Western Bank varies considerably with different seasons. The amount shown in the table is smaller than the recent average annual catch by Gloucester vessels. The Western Bank, as well as La Have, has been at times quite noted as a halibut fishing-ground. In recent years, however, its value for this species has decreased materially.

Quereau Bank is not much resorted to by cod-fishing vessels from Gloucester, chiefly because of the small size and comparatively poor quality of fish on that bank. It is, however, a favorite fishing-ground for halibut, which are taken in deep water (150 to 400 fathoms) along the eastern, southern, and western edges of the bank.

Misaine Bank is seldom visited by New England fishing vessels.

Grand Bank and Flemish Cap are included under one head, for the reason that it is impracticable to designate definitely the quantity of fish taken on either, since the vessels that go to Flemish Cap usually spend a portion of their time in fishing upon the Grand Bank. The fleet resorting to the Flemish Cap is a comparatively small one, and the fishery there is carried on chiefly in May, June, and July. Some halibut are taken on the Flemish Cap and salted, but no fresh halibut are received from that bank. The fresh-halibut fishery on the Grand Bank is pursued vigorously throughout the year. The cod fishery, however, seldom or never begins before March. It is at its height from May to September. The fares arriving after September are composed for the most part of fish taken earlier in the season. The codfish received from the Grand Bank in November and December are brought in chiefly by vessels that start late in the season on their second or third fares. The cod fishery on the Bank may be considered closed in November, though some fares arrive home at a later date.

The Iceland fishing-grounds have come into prominence in recent years, and now furnish practically all the salt halibut. Vessels leave home in March and April, and return in August, September, and October. The bulk of the catch is obtained in May, June, and July.

The Cape Shore cod fishery is prosecuted in spring, summer, and autumn, beginning about April 1 and continuing until the close of the year. It is most active, however, in midsummer and early autumn, and is engaged in chiefly by vessels which, earlier in the season, may visit the Western Bank or La Have, or which in winter and early spring may find employment in the shore cod fishery off the New England coast.

The fishing-ground about Cape North, which is the northernmost point of Cape Breton Island, has in some seasons been quite noted for the number of fares of codfish obtained there. The cod fishery in this region is irregular, due largely to the fact that it is entirely a spring fishery, and operations may be interfered with or prevented by the presence of masses of drifting ice which come down from the Gulf of St. Lawrence and cover the fishing-ground. Fares of halibut have occasionally been taken in this locality.

The Gulf of St. Lawrence is not resorted to by cod-fishing vessels of New England except on very rare occasions, but it is a noted fishing-ground for mackerel, though its value as such has materially decreased in recent years. The mackerel fishery in the Gulf begins in June and generally continues until some time in October. The last vessels of the fleet generally reach the home port in November. The relatively large receipts of mackerel from this fishing-ground are due to the fact that the fares brought in at the close of the season in most cases were the entire year's catch for the vessels engaged. It may be explained that the grounds resorted to in the Gulf of St. Lawrence by American fishermen are outside the 3-mile limit, with the exception of those about the Magdalene Islands and western Newfoundland, where Americans have the right to fish inside of territorial limits.

87.—Table showing by fishing-grounds the quantities of fresh ground fish landed at Boston, Mass., in 1889, by New England fishing vessels.

Fishing-grounds.	Cod.	Haddock.	Halibut.	Hake.	Pollock.	Cusk.	Total.
Offshore:	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*
Western Bank	7,000	2,000	7,000	.....	.....	.....	16,000
La Have Bank	431,700	1,090,000	15,860	46,500	.....	7,100	1,591,160
Browns Bank	333,000	201,000	39,300	68,200	7,000	12,200	660,700
Georges Bank	6,400,150	13,663,500	95,683	561,150	27,010	35,550	20,783,143
Clark Bank	45,100	154,000	4,590	42,800	280	.....	246,770
Marblehead Bank	5,000	4,000	500	3,000	2,500	1,000	16,000
Cashes Bank	52,400	97,000	1,100	37,500	500	3,500	191,900
Nantucket Shoals	536,250	773,850	2,590	92,925	13,150	9,800	1,428,565
South Channel	2,935,363	5,016,300	92,870	1,612,410	187,619	42,816	9,887,378
Total	10,745,963	21,001,650	259,493	2,464,485	238,059	111,966	34,821,616
Inshore:							
Middle (Stellwagen) Bank	289,860	1,019,135	7,002	505,845	34,750	13,025	1,869,617
Tillies Bank	5,800	70,700	100	30,000	1,400	9,000	117,000
Ipswich Bay	9,000	9,100	.....	17,750	.....	.....	35,850
Jeffrey Ledge	436,280	1,296,100	15,650	727,050	312,700	36,550	2,824,330
Cape Shore	728,900	1,016,500	26,456	116,250	4,666	27,250	1,920,022
Shore, general	1,210,174	2,759,905	22,240	678,640	38,190	22,109	4,731,258
Total	2,680,014	6,171,440	71,448	2,075,535	391,706	107,934	11,498,077
Grand total	13,425,977	27,173,090	330,941	4,540,020	629,765	219,900	46,319,693

88.—Table showing by fishing-grounds and months the quantities of fresh and salt mackerel landed at Boston, Mass., in 1889 by New England fishing vessels.

Fishing-grounds.	June.		July.		August.		September.		October.		November.		Total.	
	Fresh.	Salt.	Fresh.	Salt.	Fresh.	Salt.	Fresh.	Salt.	Fresh.	Salt.	Fresh.	Salt.	Fresh.	Salt.
	Lbs.	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*
Barnstable Bay	.....	.....	.....	.....	19,750	.....	41,075	.....	61,275	.....	.....	.....	122,100	.....
Block Island	.....	.....	.....	19,200	.....	21,600	.....	.....	.....	.....	.....	.....	.....	40,800
Boon Island	.....	.....	.....	.....	14,800	.....	.....	.....	.....	.....	.....	.....	14,800	.....
Cape Cod Bay	14,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	14,000	.....
Chatham	6,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6,000	.....
Eastern Shore	.....	.....	.....	.....	.....	21,000	.....	.....	.....	.....	.....	.....	.....	21,000
Garnet	.....	.....	.....	.....	.....	.....	6,500	.....	.....	.....	.....	.....	6,500	.....
Gloucester	.....	.....	16,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	16,000	.....
Halfway Rock	.....	.....	.....	.....	.....	.....	13,750	.....	.....	.....	.....	.....	13,750	.....
Jeffrey Bank	.....	.....	.....	.....	10,000	.....	.....	.....	.....	.....	.....	.....	10,000	.....
Matinicus	.....	.....	.....	9,600	.....	.....	.....	.....	.....	.....	.....	.....	.....	9,600
Marblehead	.....	.....	2,000	.....	.....	.....	11,000	.....	.....	.....	.....	.....	13,000	.....
Middle Bank	.....	.....	8,500	.....	48,700	600	.....	.....	.....	.....	.....	.....	57,200	600
Minots Light	.....	.....	40,000	.....	2,500	800	88,680	.....	.....	.....	.....	.....	131,180	800
Monhegan	.....	.....	.....	1,400	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,400
Nahant	.....	.....	5,500	.....	.....	.....	700	.....	.....	.....	.....	.....	6,200	.....
Plymouth	.....	.....	500	.....	42,050	.....	1,000	.....	.....	.....	.....	.....	43,550	.....
Provincetown	6,000	.....	16,000	.....	7,450	.....	.....	.....	.....	.....	.....	.....	29,450	.....
Race Point	.....	.....	4,000	.....	7,450	.....	800	.....	.....	.....	.....	.....	12,250	.....
Shore Grounds	.....	.....	.....	.....	.....	.....	900	91,600	.....	13,000	.....	36,600	900	141,200
Swampscott	.....	.....	.....	.....	1,100	.....	.....	.....	.....	.....	.....	.....	1,100	.....
Thatcher Island	.....	.....	13,000	.....	1,500	.....	8,000	.....	.....	.....	.....	.....	22,500	.....
Total	26,000	.....	105,500	30,200	155,300	44,000	172,405	91,600	61,275	13,000	.....	36,600	520,480	215,400

V.—THE FISHERIES OF RHODE ISLAND.

GENERAL REMARKS AND STATISTICS.

The fisheries of Rhode Island rank fourth in importance among the New England States, although if the value of only free-swimming fish be considered the State leads Connecticut. The menhaden fishery and industry are of greater extent than elsewhere in New England; the oyster fishery ranks next to that of Connecticut; and the quantity of scup taken far exceeds the catch in all the other States.

Condensed statistics of the fisheries of the State are first presented in the form of three tables, which cover persons engaged, capital invested, and products, respectively.

Compared with 1880, there has been a decline in some branches and an advance in others, as shown in Section I of this paper. Especially noteworthy are the decrease in the number of vessels (*from 92 to 69*) and the improvement in their construction as shown by the average value, which was $2,085 in 1880 and $2,854 in 1889.

89.—Table of persons employed.

How engaged.	No.
On fishing vessels	376
On transporting vessels	12
In shore fisheries	896
On shore, in factories, etc	473
Total	1,757

90.—Table of apparatus and capital.

Designation.	No.	Value.
Vessels fishing (tonnage 1,402.05)	62	$194,325
Outfit	.....	26,385
Vessels transporting (tonnage 82.74)	7	2,625
Outfit	.....	400
Boats	651	62,743
Apparatus of capture—vessel fisheries:		
Seines	19	12,100
Gill nets	3	30
Hand lines and trawl lines	.....	2,390
Pots	60	120
Harpoons	30	450
Dredges and rakes	.....	635
Apparatus of capture—shore fisheries:		
Haul seines	32	1,850
Gill nets	114	7,600
Pound nets and trap nets	182	81,800
Fyke nets	376	2,680
Hand lines and trawl lines	.....	235
Pots	5,145	6,383
Dredges, tongs, etc	.....	3,144
Shore property	.....	369,759
Cash capital	.....	244,524
Total	.....	1,020,178

91.—Table of products.

Species.	Vessel fisheries.		Shore fisheries.		Total.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Alewives, fresh			499,450	$7,518	499,450	$7,518
Alewives, salted			412,000	8,240	412,000	8,240
Alewives, smoked			134,800	2,380	134,800	2,380
Bluefish, fresh	5,500	$350	401,375	26,648	406,875	26,998
Bluefish, salted	1,800	90			1,800	90
Butter-fish, fresh			267,050	9,827	267,050	9,827
Cod, fresh	216,940	6,538	85,000	2,490	301,940	9,028
Cod, salted	52,276	1,570	11,200	500	63,476	2,070
Eels, fresh			249,450	11,878	249,450	11,878
Flatfish and flounders			529,750	12,425	529,750	12,425
Haddock, fresh	98,120	2,207	5,000	125	103,120	2,332
Haddock, salted	10,640	212			10,640	212
Kingfish, fresh			9,700	291	9,700	291
Mackerel, fresh	26,612	2,581	270,000	22,500	296,612	25,081
Mackerel, salted	182,000	15,555	120,000	9,000	302,000	24,555
Menhaden, fresh	112,580,000	281,450			112,580,000	281,450
Perch or cunners, fresh			16,000	640	16,000	640
Pollock, salted, fresh			51,520	1,840	51,520	1,840
Sea bass, fresh			493,150	13,823	493,150	13,823
Scup, fresh			6,063,800	91,921	6,063,800	91,921
Shad, fresh			16,650	1,149	16,650	1,149
Smelt, fresh			84,500	4,195	84,500	4,195
Squeteague, fresh			406,214	16,844	406,214	16,844
Striped bass, fresh			80,340	7,291	80,340	7,291
Swordfish, fresh	165,990	7,417			165,990	7,417
Tautog, fresh			187,625	7,700	187,625	7,700
Miscellaneous fish, fresh			46,250	925	46,250	925
Refuse fish, fresh			1,106,200	1,770	1,106,200	1,770
Lobsters	8,500	595	447,500	20,970	456,000	21,565
Crabs			4,460	1,125	4,460	1,125
Clams (soft)	3,000	165	330,750	32,310	*333,750	32,475
Quahogs	25,200	2,575	212,000	23,025	†237,200	25,600
Scallops	2,700	300	20,250	2,250	‡22,950	2,550
Oysters	401,345	76,705	1,022,868	195,234	§1,424,213	271,939
Total	113,780,623	398,310	13,584,852	536,834	127,365,475	935,144

*33,375 bushels. †29,650 bushels. ‡6,557 bushels. §203,459 bushels.

THE VESSEL FISHERIES.

This State resembles Maine in having vessel fisheries of less value than the shore fisheries. In the succeeding tables the vessel fisheries are exhibited from various points of view, including by counties, by customs districts, by apparatus, and by fisheries.

There are three counties in Rhode Island from which vessel fishing is prosecuted; these are Providence, Bristol, and Newport. The fisheries in each county are exhibited in three tables. From the first it will be seen that of the 388 persons employed on vessels, 333 were in Newport County, and only 34 and 21 in Providence and Bristol counties, respectively. Only 2 aliens were found on Rhode Island vessels, a much smaller percentage than occurs in any other New England State.

The capital invested in vessel fisheries, as shown in Table 93, was $239,460, of which $205,655 was credited to Newport County, $18,855 to Providence County, and $14,950 to Bristol County. Of the 62 fishing vessels in the State, 42 were owned in Newport County, and all of the 7 transporting vessels belonged in the same county.

In Newport County 113,330,388 pounds of products were taken, worth to the fishermen $317,337. Menhaden is by far the most important species taken, amounting to 112,580,000 pounds, valued at $281,450. Mackerel ranks second among the products of the county, the catch being 199,012 pounds, worth $17,240. Cod, swordfish, and haddock are the only other species of any prominence. Vessels of Providence County took 355,735 pounds of fishery products and stocked $62,919, the catch being principally oysters, which amounted to 43,835 bushels, worth $58,651. Next to oysters, quahogs are the most important species. The entire catch in Bristol County consists of oysters, of which 13,500 bushels, valued at $18,054, were secured.

92.—Table showing by counties the number and nationality of persons employed in the vessel fisheries of Rhode Island in 1889.

Counties.	Number and nationality of men on fishing vessels.			Number and nationality of men on transporting vessels.		
	Americans.	All others.	Total.	Americans.	All others.	Total.
Providence	34	.....	34	.....	.....	.....
Bristol	21	.....	21	.....	.....	.....
Newport	319	2	321	12	.....	12
Total	374	2	376	12	.....	12

93.—Table showing by counties the number, tonnage, value, and outfits of vessels employed in the vessel fisheries of Rhode Island in 1889.

Counties.	Vessels.							
	Fishing.				Transporting.			
	No.	Tonnage.	Value.	Value of outfit.	No.	Tonnage.	Value.	Value of outfit.
Providence	12	126.49	$15,700	$2,599	.....	.....	.....	.....
Bristol	8	79.59	12,800	1,901	.....	.....	.....	.....
Newport	42	1,195.97	165,825	21,885	7	82.74	$2,625	$400
Total	62	1,402.05	194,325	26,385	7	82.74	2,625	400

Counties.	Apparatus of capture.												Total investment.
	Seines.		Gill nets.		Hand lines and trawl lines.		Pots.		Harpoons.		Dredges and rakes.		
	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	
Providence	....	.....	3	$30	....	$110	....	.....	2	$30	....	$386	$18,855
Bristol	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	....	249	14,950
Newport	19	$12,100	....	.....	....	2,280	60	$120	28	420	....	.....	205,655
Total	19	12,100	3	30	....	2,390	60	120	30	450	....	635	239,460

94.—Table showing by counties the yield of the vessel fisheries of Rhode Island in 1889.

Species.	Providence.		Bristol.		Newport.		Total.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Bluefish, fresh	.....	.....	.....	.....	5,500	$350	5,500	$350
Bluefish, salted	.....	.....	.....	.....	1,800	90	1,800	90
Cod, fresh	3,000	$90	.....	.....	213,940	6,448	216,940	6,538
Cod, salted	.....	.....	.....	.....	52,276	1,570	52,276	1,570
Haddock, fresh	.....	.....	.....	.....	98,120	2,207	98,120	2,207
Haddock, salted	.....	.....	.....	.....	10,640	212	10,640	212
Mackerel, fresh	8,000	760	.....	.....	18,612	1,821	26,612	2,581
Mackerel, salted	1,600	136	.....	.....	180,400	15,419	182,000	15,555
Menhaden, fresh	.....	.....	.....	.....	112,580,000	281,450	112,580,000	281,450
Swordfish, fresh	5,390	242	.....	.....	160,600	7,175	165,990	7,417
Lobsters	.....	.....	.....	.....	8,500	595	8,500	595
Clams (soft)	3,000	105	.....	.....	.....	.....	3,000	105
Quahogs	25,200	2,575	.....	.....	.....	.....	25,200	2,575
Scallops	2,700	300	.....	.....	.....	.....	2,700	300
Oysters	306,845	58,651	94,500	$18,054	.....	.....	401,345	76,705
Total	355,735	62,919	94,500	18,054	113,330,388	317,337	113,780,623	398,310

Certain average figures for the vessels in the three counties are presented in the following table. Newport County ranks first in the items of average tonnage, average value, average value of apparatus and outfit, average number of crew, and average

stock; Providence County excels in average value of catch per man, average value of catch per net ton, and average value of catch per each $100 invested in the vessel fishery; Bristol County leads in the single point of average value per ton.

95.—Table showing by counties certain average figures for the vessels employed in the fisheries of Rhode Island in 1889.

Counties.	Net tonnage.	Value per ton.	Value per vessel.	Value of apparatus and outfit.	No. of men to vessel.	Value of catch per man.	Value of catch per vessel.	Value of catch per each ton employed.	Value of catch per each $100 invested in fishing vessels.
Providence	10.54	$124	$1,308	$263	3	$1,850	$5,243	$497	$338
Bristol	9.95	161	1,600	269	2	858	2,257	227	120
Newport	28.48	139	3,948	876	8	1,030	7,556	265	156

The customs districts of Rhode Island correspond so closely with the counties that no discussion of the tables seems necessary. The statistics are given in the three following tables:

96.—Summary by customs districts of the vessel fisheries of Rhode Island in 1889.

Customs districts.	No. of vessels fishing.	Net tonnage.	Value of vessels.	Value of outfit, gear, provisions, fuel, etc.	Number and nationality of fishermen.			Value of catch.
					Americans.	All others.	Total.	
Newport	42	1,195.97	$165,825	$36,805	319	2	321	$317,337
Bristol and Warren	6	54.31	8,800	1,900	17	.....	17	6,012
Providence	14	151.77	19,700	3,405	38	.....	38	74,961
Total	62	1,402.05	194,325	42,110	374	2	376	398,310

Customs districts.	No. of vessels transporting.	Net tonnage.	Value of vessels.	Value of outfit, provisions, fuel, etc.	Number and nationality of crew.			Value of products transported.
					Americans.	All others.	Total.	
Newport	7	82.74	$2,625	$400	12	.....	12	$12,550
Bristol and Warren	.....	.....	.....	.....	.....	.....	.....	.....
Providence	.....	.....	.....	.....	.....	.....	.....	.....
Total	7	82.74	2,625	400	12	.....	12	12,550

97.—Table showing by species and customs districts the yield of the vessel fisheries of Rhode Island in 1889.

Species.	Newport.		Bristol and Warren.		Providence.		Total.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Bluefish, fresh	5,500	$350	.....	.....	.....	.....	5,500	$350
Bluefish, salted	1,800	90	.....	.....	.....	.....	1,800	90
Cod, fresh	213,940	6,448	.....	.....	3,000	$90	216,940	6,538
Cod, salted	52,276	1,570	.....	.....	.....	.....	52,276	1,570
Haddock, fresh	98,120	2,207	.....	.....	.....	.....	98,120	2,207
Haddock, salted	10,640	212	.....	.....	.....	.....	10,640	212
Mackerel, fresh	18,612	1,821	.....	.....	8,000	760	26,612	2,581
Mackerel, salted	180,400	15,419	.....	.....	1,600	136	182,000	15,555
Menhaden, fresh	112,580,000	281,450	.....	.....	.....	.....	112,580,000	281,450
Swordfish, fresh	160,600	7,175	.....	.....	5,390	242	165,990	7,417
Lobster, fresh	8,500	595	.....	.....	.....	.....	8,500	595
Clams (soft), fresh	.....	.....	.....	.....	3,000	165	3,000	165
Quahogs, fresh	.....	.....	.....	.....	25,200	2,575	25,200	2,575
Scallops, fresh	.....	.....	.....	.....	2,700	300	2,700	300
Oysters	.....	.....	31,500	$6,012	369,845	70,693	401,345	76,705
Total	113,330,388	317,337	31,500	6,012	418,735	74,961	113,780,623	398,310

98.—Table showing by customs districts the average tonnage, value, crew, and stock of vessels employed in the fisheries of Rhode Island in 1889.

Customs districts.	Average tonnage.		Average value.		Average value of outfit and apparatus.		Average number of crew.		Average gross stock.	
	Fishing.	Transporting.	Fishing.	Transporting.	Fishing.	Transporting.	Fishing.	Transporting.	Fishing.	Transporting.
Newport	28.48	10.82	$3,948	$375	$876	$56	8	2	$7,556	*$1,793
Bristol and Warren	9.05	.....	1,467	.....	317	.....	3	.....	1,002	.....
Providence	10.84	.....	1,407	.....	243	.....	3	.....	5,354	.....

* The value of products freighted.

The quantities of fish obtained with the different forms of apparatus, together with their value, are next presented in a single table. Seines, gill nets, and harpoons take only a single species each, while lines are employed in the capture of four species. Seines are more important than all the other forms combined and are credited with 112,580,000 pounds of menhaden, valued at $281,450; nets stocked only $83, on mackerel; harpoons took swordfish to the value of $7,417, and the catch with lines was valued at $29,020, being made up of mackerel, cod, haddock, and bluefish, the species ranking in the order given.

99.—Table showing by apparatus and species the yield of the vessel fisheries of Rhode Island in 1889, exclusive of the molluscan and crustacean fisheries.

Apparatus and species.	Pounds.	Value.	Apparatus and species.	Pounds.	Value.
Lines:			Seines:		
Bluefish, fresh	5,500	$350	Menhaden, fresh	112,580,000	$281,450
Bluefish, salted	1,800	90			
Cod, fresh	216,940	6,538	Gill nets:		
Cod, salted	52,276	1,570	Mackerel, fresh	920	83
Haddock, fresh	98,120	2,207			
Haddock, salted	10,640	212	Harpoons:		
Mackerel, fresh	25,692	2,498	Swordfish, fresh	165,990	7,417
Mackerel, salted	182,000	15,555			
Total	592,968	29,020	Grand total	113,339,878	317,970

More vessels of Rhode Island are engaged in the mackerel fishery than in any other branch. Although mackerel were scarce in 1889, the prevailing high price which the fish commanded was a strong incentive to undertake the pursuit of that species; 26 vessels, with a tonnage of 291.63, carrying 97 men, followed the fishery during the season, and took 208,612 pounds, for which $18,136 was received. The average stock per vessel was therefore $698, a sum considerably in excess of that obtained in the shore, swordfish, and lobster fisheries.

The shore fishery had a fleet of 21 vessels, with a tonnage of 249.81, and with crews aggregating 84 men. The catch, consisting of bluefish, cod, and haddock, amounted to 385,276 pounds, which was sold fresh and salted, the aggregate stock being $10,967, or an average of $522 per vessel.

The menhaden fleet consisted of 16 sail, the total tonnage of which was 890.05. The value of the menhaden vessels was $137,000, an average of $8,563. This figure is unusually large, and is due to the employment of steam vessels with a relatively high valuation per ton. The quantity of fish taken was 112,580,000 pounds, equivalent to 188,007,600 fish, having a value of $281,450. The average stock of the vessels was

$17,591. It is hardly necessary to remark that no other New England fishery, with the possible exception of the Pacific whale fishery carried on by vessels of New Bedford, now yields such large average returns. In 1880, when there were 61 Rhode Island vessels engaged in taking menhaden, the average catch was 1,126,128 pounds (against 7,036,250 pounds in 1889), and the average stock was only $2,815. There has been a gradual substitution of steam for sail vessels since 1880, with the striking improvement noted.

Sixteen vessels also engaged in the capture of swordfish; their tonnage was 232.43 and their complement of men 64. The result of the fishery was 165,990 pounds, for which the fishermen received $7,417, an average of $464 per vessel.

The fisheries for oysters, quahogs, soft clams, and scallops were followed by 17 vessels with a tonnage of 180.17, and with crews numbering 44 men. The oyster was the most valuable species taken, representing $76,705 out of the aggregate sum of $79,745 accruing from all molluscan fisheries. The large average stock in 1889, viz, $4,691, was due to the employment of steam vessels in taking oysters.

A single vessel of 5.45 tons, carrying 2 men, engaged in the lobster fishery in 1889, taking 8,500 pounds of that product, valued at $595. The vessel lobster fishery is much less important than that followed with small boats.

Two tables covering the vessel fisheries of Rhode Island, classified by fisheries, are presented.

100.—Table showing the number of vessels engaged in each fishery in Rhode Island in 1889, together with their tonnage, value, and number of crew.

Fisheries.	No. of vessels.	Net tonnage.	Value of vessels.	Number and nationality of crew.		
				Americans.	All others.	Total.
Shore	21	249.81	$21,200	82	2	84
Mackerel	26	291.63	22,325	95	2	97
Menhaden	16	890.05	137,000	219	.....	219
Swordfish	16	232.43	24,525	62	2	64
Crustacean	1	5.45	500	2	.....	2
Molluscan	17	180.17	26,350	44	.....	44

101.—Table showing by fisheries and species the yield of the vessel fisheries of Rhode Island in 1889.

Fisheries and species.	Pounds.	Value.	Fisheries and species.	Pounds.	Value.
Shore:			Menhaden:		
Bluefish, fresh	5,500	$350	Menhaden, fresh	112,520,000	$281,450
Bluefish, salted	1,800	90	Swordfish:		
Cod, fresh	216,940	6,538	Swordfish, fresh	165,990	7,417
Cod, salted	52,276	1,570	Crustacean:		
Haddock, fresh	98,120	2,207	Lobster	8,500	595
Haddock, salted	10,640	212			
Total	385,276	10,967	Molluscan:		
			Clams (soft)	3,000	165
Mackerel:			Quahogs	25,200	2,575
Mackerel, fresh	26,612	2,581	Scallops	2,700	300
Mackerel, salted	182,000	15,555	Oysters	401,345	76,705
Total	208,612	18,136	Total	432,245	79,745
			Grand total	113,780,623	398,310

THE SHORE FISHERIES.

The shore fisheries of Rhode Island surpass the vessel fisheries in the items of persons employed and products, but represent less capital. They rank third in importance among the shore fisheries of New England, exceeding in value those of Connecticut and New Hampshire. The specially prominent feature of this branch is the pound-net and trap-net fishery, which reaches large proportions.

Shore fishing is prosecuted from every county in the State, but is most important in Newport County, in which 352 of the 896 shore fishermen are employed. Washington County has 205 fishermen, Kent County 146, Providence County 118, and Bristol 75. Newport County also leads in the amount of capital invested, the other counties being in about the above order.

In the item of products and value, Newport County takes higher rank than in persons engaged and capital invested. In 1889, the shore fisheries of the county were credited with yielding 8,605,559 pounds, valued at $199,249, while the catch for all counties was only 13,584,852 pounds, worth $536,834. The most important species in this county are scup, mackerel, bluefish, squeteague, and lobsters, in which the county ranks first. Providence County comes next with 787,120 pounds, valued at $128,215, of which 588,595 pounds, worth $112,599, represent oysters, in the output of which this county takes the first position. Washington County has a greater variety of water products than any county except Newport and yields a much larger quantity than Providence, although the value is considerably less; in 1889 3,116,200 pounds were taken, for which the fishermen received $75,951; the principal species in the county are alewives, butter-fish, eels, scup, flatfish, and flounders, in the catch of some of which the county leads all others. Bristol County, which has an unimportant net fishery, ranks second in the extent of its shore oyster fishery, which represents $73,111, while fish proper are worth only $965. The shore fisheries of Kent County are of less magnitude than those of the other counties, although the clam fishery is more important than elsewhere and the scallop fishery is followed only in this county.

The extent of the shore fisheries of each county is shown in the three tables which follow:

102.—Table showing by counties the number of persons engaged in the shore fisheries of Rhode Island in 1889.

Counties.	No.
Washington	205
Kent	146
Providence	118
Bristol	75
Newport	352
Total	896

103.—Table showing by counties the apparatus employed in the shore fisheries of Rhode Island in 1889.

Designation.	Washington.		Kent.		Providence.		Bristol.		Newport.		Total.	
	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.
Boats	135	$7,265	84	$9,960	111	$14,063	79	$8,955	242	$22,500	651	$62,743
Pound nets and trap nets	85	15,400	2	200	3	300	5	400	87	65,500	182	81,800
Fyke nets	126	1,030	150	450	.....	.....	.....	.....	100	600	376	2,680
Gill nets	5	410	33	2,780	3	200	.....	.....	73	4,210	114	7,600
Seines	27	1,500	2	150	3	200	.....	.....	.....	.....	32	1,850
Hand lines and trawl lines	.....	58	.....	60	.....	.....	.....	.....	.....	117	.....	235
Pots	920	1,150	275	133	1,000	250	.....	.....	2,950	4,850	5,145	6,383
Dredges	.....	.....	111	950	.....	.....	24	252	.....	.....	135	1,202
Tongs	1	5	14	76	183	900	168	832	.....	.....	366	1,813
Dip nets	.....	15	.....	.....	.....	.....	.....	.....	.....	.....	.....	15
Clamming apparatus	.....	24	.....	70	.....	20	.....	.....	.....	.....	.....	114
Total	.....	27,457	.....	14,829	.....	15,933	.....	10,439	.....	97,777	.....	166,435

104.—Table showing by counties and species the yield of the shore fisheries of Rhode Island in 1889.

Species.	Washington.		Kent.		Providence.		Bristol.		Newport.		Total.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Alewives, fresh	79,450	$1,213	1,000	$20	.....	.....	.....	.....	419,000	$6,285	499,450	$7,518
Alewives, salted	412,000	8,240	.....	.....	.....	.....	.....	.....	.....	.....	412,000	8,240
Alewives, smoked	130,300	2,290	.....	.....	4,500	$90	.....	.....	.....	.....	134,800	2,380
Bluefish, fresh	38,950	2,532	14,500	1,015	1,500	150	.....	.....	346,425	22,951	401,375	26,648
Butter-fish, fresh	192,500	7,850	10,500	233	19,050	494	15,000	$450	30,000	800	267,050	9,827
Cod, fresh	.....	.....	.....	.....	.....	.....	.....	.....	85,000	2,490	85,000	2,490
Cod, salted	.....	.....	.....	.....	.....	.....	.....	.....	11,200	500	11,200	500
Eels, fresh	174,500	8,132	32,750	1,638	26,000	1,300	200	8	16,000	800	249,450	11,878
Flounders, fresh	210,000	4,873	67,500	1,585	7,250	155	.....	.....	245,000	5,812	529,750	12,425
Haddock, fresh	5,000	125	.....	.....	.....	.....	.....	.....	.....	.....	5,000	125
Kingfish, fresh	9 700	291	.....	.....	.....	.....	.....	.....	.....	.....	9,700	291
Mackerel, fresh	.....	.....	.....	.....	.....	.....	.....	.....	270,000	22,500	270,000	22,500
Mackerel, salted	.....	.....	.....	.....	.....	.....	.....	.....	120,000	9,000	120,000	9,000
Perch, fresh	16,000	640	.....	.....	.....	.....	.....	.....	.....	.....	16,000	640
Pollock, salted	.....	.....	.....	.....	.....	.....	.....	.....	51,520	1,840	51,520	1,840
Sea bass, fresh	14,100	484	18,650	688	1,000	40	200	6	459,200	12,605	493,150	13,823
Scup, fresh	622,600	9,610	6,000	180	.....	.....	200	6	5,435,000	82,125	6,063,800	91,921
Shad, fresh	11,850	789	1,300	125	1,500	135	2,000	100	.....	.....	16,650	1,149
Smelt, fresh	81,000	3,900	3,500	295	.....	.....	.....	.....	.....	.....	84,500	4,195
Squeteague, fresh	134,000	5,700	30,250	1,120	6,000	355	5,000	200	230,964	9,469	406,214	16,844
Striped bass, fresh	55,240	5,102	5,000	400	5,600	452	1,000	90	13,500	1,247	80,340	7,291
Tautog, fresh	116,500	4,340	11,000	520	6,125	320	3,000	90	51,000	2,430	187,625	7,700
Miscellaneous, fresh	10,500	210	.....	.....	.....	.....	.....	.....	35,750	715	46,250	925
Refuse fish, fresh	676,200	845	.....	.....	.....	.....	10,000	15	420,000	910	1,106,200	1,770
Lobsters	81,500	4,200	.....	.....	.....	.....	.....	.....	366,000	16,770	447,500	20,970
Crabs	4,460	1,125	.....	.....	.....	.....	.....	.....	.....	.....	4,460	1,125
Clams (soft)	37,750	3,010	193,000	19,300	100,000	10,000	.....	.....	.....	.....	330,750	32,310
Quahogs	.....	.....	192,000	20,900	20,000	2,125	.....	.....	.....	.....	212,000	23,025
Scallops	.....	.....	20,250	2,250	.....	.....	.....	.....	.....	.....	20,250	2,250
Oysters	2,100	450	44,100	9,074	588,595	112,599	388,073	73,111	.....	.....	1,022,868	195,234
Total	3,116,200	75,951	651,300	59,343	787,120	128,215	424,673	74,076	8,605,559	199,249	13,584,852	536,834

The relative importance of each of the various means of capture is illustrated in the next table, the specification being by counties and species. Of the apparatus employed in the capture of fish proper, pound nets and trap nets are by far the most effective devices, yielding 9,683,879 pounds, chiefly scup, alewives, and squeteague, worth $171,771. Lines took 759,720 pounds in 1889, principally mackerel, for which the fishermen got $46,758. Pots were the next most important apparatus if lobsters are included, taking 562,250 pounds, valued at $26,810. Gill nets stocked $18,841, seines $15,665, and fyke nets $3,045. Such miscellaneous apparatus as dredges, tongs, rakes, etc., produced 1,590,328 pounds of crabs, clams, oysters, scallops, etc., worth $253,944.

105.—Table showing by counties and apparatus the yield of the shore fisheries of Rhode Island in 1889.

Apparatus and species.	Washington.		Kent.		Providence.		Bristol.		Newport.		Total.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Seines:												
Alewives, fresh	4,450	$88	1,000	$20							5,450	$108
Alewives, salted	395,850	7,917									395,850	7,917
Alewives, smoked	58,000	1,250			4,500	$90					62,500	1,340
Bluefish, fresh			5,500	385							5,500	385
Butter-fish, fresh			1,000	20	6,550	244					7,550	264
Eels, fresh	39,400	2,009									39,400	2,009
Flounders, fresh					4,250	95					4,250	95
Perch, fresh	16,000	640									16,000	640
Sea bass, fresh					1,000	40					1,000	40
Shad, fresh	4,000	200	1,300	125	1,500	135					6,800	460
Smelt, fresh	13,500	675	3,500	295							17,000	970
Squeteague, fresh			500	30	4,000	235					4,500	265
Striped bass, fresh			5,000	400	5,600	452					10,600	852
Tautog, fresh					6,125	320					6,125	320
Total	531,200	12,779	17,800	1,275	33,525	1,611					582,525	15,665
Gill nets:												
Bluefish, fresh	10,000	650	9,000	630	1,500	150			245,150	$16,368	265,650	17,798
Butter-fish, fresh			1,500	53							1,500	53
Squeteague, fresh			24,750	990							24,750	990
Total	10,000	650	35,250	1,673	1,500	150			245,150	16,368	291,900	18,841
Pound and trap nets:												
Alewives, fresh	75,000	1,125							419,000	6,285	494,000	7,410
Alewives, salted	16,150	323									16,150	323
Alewives, smoked	72,300	1,040									72,300	1,040
Bluefish, fresh	23,950	1,582							47,925	3,163	71,875	4,745
Butter-fish, fresh	192,500	7,850	8,000	160	12,500	250	15,000	$450	30,000	800	258,000	9,510
Eels, fresh	95,100	4,021					200	8			95,300	4,029
Flounders, fresh	180,750	4,078	2,000	40	3,000	60			210,000	4,762	395,750	8,940
Kingfish, fresh	9,700	291									9,700	291
Scup, fresh	622,600	9,610	6,000	180			200	6	5,435,000	82,125	6,063,800	91,921
Sea bass, fresh	14,100	484					200	6	459,200	12,605	473,500	13,095
Shad, fresh	7,850	589					2,000	100			9,850	689
Smelt, fresh	67,500	3,225									67,500	3,225
Striped bass, fresh	55,240	5,102					1,000	90	13,500	1,247	69,740	6,439
Squeteague, fresh	134,000	5,700	5,000	100	2,000	120	5,000	200	230,964	9,469	376,964	15,589
Tautog, fresh	48,000	1,560					3,000	90	6,000	180	57,000	1,830
Refuse fish, fresh	676,200	845					10,000	15	420,000	910	1,106,200	1,770
Miscellaneous fish, fresh	10,500	210							35,750	715	46,250	925
Total	2,301,440	47,635	21,000	480	17,500	430	36,600	965	7,307,339	122,261	9,683,879	171,771
Hand and trawl lines:												
Bluefish, fresh	5,000	300							53,350	3,420	58,350	3,720
Cod, fresh									85,000	2,490	85,000	2,490
Cod, salted									11,200	500	11,200	500
Flounders, fresh			15,500	345							15,500	345
Haddock, fresh	5,000	125									5,000	125
Mackerel, fresh									270,000	22,500	270,000	22,500
Mackerel, salted									120,000	9,000	120,000	9,000
Pollock, salted									51,520	1,840	51,520	1,840
Sea bass, fresh			18,650	688							18,650	688
Tautog, fresh	68,500	2,780	11,000	520					45,000	2,250	124,500	5,550
Total	78,500	3,205	45,150	1,553					636,070	42,000	759,720	46,758
Fyke nets:												
Flounders, fresh	29,250	795	50,000	1,200					35,000	1,050	114,250	3,045
Pots:												
Eels, fresh	40,000	2,102	32,750	1,638	26,000	1,300			16,000	800	114,750	5,840
Lobsters, fresh	81,500	4,200							366,000	16,770	447,500	20,970
Total	121,500	6,302	32,750	1,638	26,000	1,300			382,000	17,570	562,250	26,810
Miscellaneous:												
Crabs	4,460	1,125									4,460	1,125
Clams (soft)	37,750	3,010	193,000	19,300	100,000	10,000					330,750	32,310
Quahogs			192,000	20,900	20,000	2,125					212,000	23,025
Scallops			20,250	2,250							20,250	2,250
Oysters	2,100	450	44,100	9,074	588,595	112,599	388,073	73,111			1,022,868	195,234
Total	44,310	4,585	449,350	51,524	708,595	124,724	388,073	73,111			1,590,328	253,944
Grand total	3,116,200	75,951	651,300	59,343	787,120	128,215	424,673	74,076	8,605,559	199,249	13,584,852	536,834

The following table, based on the preceding, illustrates the relative quantity and value of the products taken in the various kinds of apparatus used in the shore fisheries. It is of interest to observe the great difference which exists between the percentage of quantity and value in some forms of apparatus. Although pound nets and trap nets yield over 71 per cent of the shore products, the value of the catch is only 32 per cent, while dredges, tongs, etc., secure only 11 per cent of the quantity but 47 per cent of the value.

106.—Table showing the relative quantity and value of yield in each principal form of apparatus of capture employed in the shore fisheries of Rhode Island in 1889.

Apparatus.	Percentage.	
	Quantity.	Value.
Seines	4.29	2.91
Gill nets	2.15	3.51
Pound nets and trap nets	71.28	32.00
Fyke nets	.84	.56
Hand lines and trawl lines	5.59	8.73
Pots	4.14	4.99
Miscellaneous	11.71	47.30
Total	100.00	100.00

Certain averages and percentages for each county are given in the next tables. Providence County ranks first in the average value of catch per man and also in the average value of catch per each $100 invested in apparatus, Bristol County being second in both these items. Washington County has the first position in the average value of catch per each $100 invested in boats, followed by Providence County.

The relative value of the catch in each form of apparatus in each county is shown. Pound nets and trap nets yield 63 per cent and 61 per cent, respectively, of the stock from the shore fisheries in Washington and Newport counties, and only 1 per cent each in Kent and Bristol counties; while dredges, tongs, etc., take 87 per cent, 97 per cent, and 99 per cent, respectively, of the value of the products in Kent, Providence, and Bristol counties, and only 6 per cent in Washington county.

The final table exhibits, for each county, the proportional value of each species to the value of the total yield.

107.—Table showing by counties certain averages and percentages of the shore fisheries of Rhode Island in 1889.

Counties.	Value of catch per each $100 invested in boats.	Value of catch per each $100 invested in apparatus.	Value of catch per each man employed.	Percentage of value of yield in principal forms of apparatus.							
				Total.	Pound nets and trap nets.	Seines.	Gill nets.	Fyke nets.	Lines.	Pots.	Miscellaneous.
Washington	$1,045	$374	$370	100.00	62.72	16.81	.86	1.05	4.22	8.30	6.04
Kent	596	1,211	406	100.00	.81	2.15	2.82	2.02	2.62	2.76	86.82
Providence	912	6,748	1,087	100.00	.33	1.26	.12	.....	.....	1.01	97.28
Bristol	827	4,938	988	100.00	1.30	.....	.....	.....	.....	.....	98.70
Newport	886	265	566	100.00	61.36	.....	8.21	.53	21.08	8.82	.....

108.—Table showing by counties the percentage of the value of each species to the total yield of the shore fisheries of Rhode Island in 1889.

Species.	Washington.	Kent.	Providence.	Bristol.	Newport.
Alewives, fresh	1.60	.03			3.15
Alewives, salted	10.85				
Alewives, smoked	3.03		.07		
Bluefish, fresh	3.33	1.71	.12		11.52
Butter-fish, fresh	10.34	.39	.38	.61	.40
Cod, fresh					1.25
Cod, salted					.25
Eels, fresh	10.71	2.76	1.01	.01	.40
Flatfish and flounders, fresh	6.42	2.67	.12		2.92
Haddock, fresh	.16				
Kingfish, fresh	.38				
Mackerel, fresh					11.29
Mackerel, salted					4.52
Perch or cunners, fresh	.84				
Pollock, salted					.92
Sea bass, fresh	.64	1.16	.03	.01	6.32
Scup, fresh	12.65	.30		.01	41.22
Shad, fresh	1.04	.21	.11	.13	
Smelt, fresh	5.13	.50			
Squeteague, fresh	7.50	1.89	.28	.27	4.75
Striped bass, fresh	6.72	.68	.35	.12	.63
Tautog, fresh	5.71	.88	.25	.12	1.22
Miscellaneous fish, fresh	.28				.36
Refuse fish, fresh	1.11			.02	.46
Lobsters	5.53				8.42
Crabs	1.48				
Clams (soft)	3.96	32.52	7.80		
Quahogs		35.22	1.66		
Scallops		3.79			
Oysters	.59	15.29	87.82	98.70	
Total	100.00	100.00	100.00	100.00	100.00

THE MENHADEN INDUSTRY.

In the following table the extent of the menhaden business, viewed as a shore industry, is exhibited. Rhode Island is now more interested in this branch than any other New England State, and the industry ranks among the most prominent enterprises of the State. The capital invested in 1889 was $452,925; 573 persons were employed, and 177,133,333 fish were handled, for which $265,700 was paid. The manufactured products, consisting of different grades of oil and various kinds of fertilizers, were worth $427,757, an increase of $217,208 over 1887 and $93,070 over 1888.

109.—Table showing the extent of the menhaden industry of Rhode Island.

Designation.	1889.
Number of factories in operation	4
Value of factories	$208,000
Amount of cash capital	$76,000
Number of shoresmen employed	358
Number of fishermen employed	215
Number of steam vessels employed	11
Net tonnage	758.45
Value	$133,000
Value of outfit	$27,000
Number of sailing vessels employed in fishing	4
Net tonnage	104.10
Value	$3,000
Value of outfit	$3,400
Number of sailing vessels employed as "carryaways"	3
Net tonnage	42.83
Value	$2,325
Value of outfit	$200
Number of menhaden handled	177,133,333
Value to fishermen	$265,700
Number of gallons of oil made	1,782,145
Value as sold	$320,743
Number of tons of scrap produced	7,397
Value as sold	$107,014

VI.—THE FISHERIES OF CONNECTICUT.

GENERAL REMARKS AND STATISTICS.

The fisheries of Connecticut rank next in general importance to those of Maine. Some special branches are of greater extent than elsewhere in New England, and others are of minor consequence compared with neighboring States. The general fisheries for food-fish are of less importance than in Rhode Island, but the taking of oysters reaches greater proportions than elsewhere in this region, and in the extent of its menhaden industry Connecticut ranks second. This State is the only one, in addition to Massachusetts, which now prosecutes mammal fisheries of commercial importance.

The river fisheries were investigated to the limits of tidewater except in the case of the Connecticut, which was canvassed for 10 miles above its mouth to Essex.

Condensed statistics for this State, covering the three points of persons employed, apparatus and capital, and products, are given in the following tables:

110.—Table of persons employed.

How engaged.	No.
On fishing vessels	1,030
On transporting vessels	32
In shore fisheries	1,252
On shore, in factories, fish-houses, etc	733
Total	3,047

111.—Table of apparatus and capital.

Designation.	No.	Value.
Vessels fishing (tonnage 5,052.60)	200	$512,155
Outfit	.....	134,652
Vessels transporting (tonnage 217.08)	14	13,395
Outfit	.....	2,050
Boats	1,353	98,595
Apparatus of capture—vessel fisheries:		
Seines	12	5,020
Lines	745	995
Pots	1,785	5,240
Harpoons	22	264
Dredges, etc	.....	23,150
Apparatus of capture—shore fisheries:		
Haul seines	43	2,730
Pound nets	113	37,800
Gill nets	62	2,524
Fyke nets	440	2,230
Lines	.....	280
Pots	9,771	19,719
Spears	215	205
Dredges, rakes, etc	.....	6,525
Shore property	.....	1,647,105
Cash capital	.....	312,200
Total	.....	2,826,834

112.—Table of products.

Species.	Vessel fisheries.		Shore fisheries.		Total.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Alewives, fresh			53,272	$670	53,272	$670
Bluefish, fresh	453,326	$22,970	63,630	4,413	516,956	27,383
Butter-fish, fresh			42,400	1,064	42,400	1,064
Cod, fresh	1,523,418	49,696	6,445	322	1,529,863	50,018
Cunners, fresh			5,000	200	5,000	200
Eels, fresh			315,150	24,930	315,150	24,930
Flatfish and flounders, fresh	7,780	177	626,200	12,828	633,980	13,005
Frostfish or tomcod, fresh			123,500	4,875	123,500	4,875
Haddock, fresh	199,290	5,309	6,300	290	205,590	5,599
Hake, fresh	900	15			900	15
Halibut, fresh	264,890	20,293			264,890	20,293
Mackerel, fresh	26,170	2,331	7,330	980	33,500	3,311
Mackerel, salted	16,100	1,539			16,100	1,539
Menhaden, fresh	41,338,834	86,812	6,652,880	13,757	47,991,714	100,569
Pollock, fresh	17,400	365			17,400	365
Red snappers, fresh	520,000	16,800			520,000	16,800
Salmon, fresh			280	222	280	222
Sea bass, fresh	209,245	13,595	40,956	3,046	250,201	16,641
Scup, fresh			6,800	170	6,800	170
Shad, fresh			195,852	16,580	195,852	16,580
Smelt, fresh			12,800	1,042	12,800	1,042
Squeteague, fresh	2,165	105	204,480	8,193	206,645	8,298
Striped bass			38,770	3,430	38,770	3,430
Swordfish, fresh	146,190	8,285			146,190	8,285
Tautog, fresh	21,340	947	217,300	10,405	238,640	11,352
Whiting, fresh			11,640	174	11,640	174
Miscellaneous fish, fresh			306,860	1,859	306,860	1,859
Lobsters	446,890	26,064	1,054,400	57,035	1,501,290	83,099
Crabs			8,300	300	8,300	300
Terrapin			3,057	1,280	3,057	1,280
Clams (soft)			263,600	24,900	[a] 263,600	24,900
Quahogs	3,600	400	167,296	20,714	[b] 170,896	21,114
Scallops			2,700	230	[c] 2,700	230
Oysters	8,332,765	830,700	2,068,262	225,107	[d] 10,401,027	1,055,807
Oyster shells [e]			7,800,000	6,500	[f] 7,800,000	6,500
Algæ			18,660,000	4,903	18,660,000	4,903
Seal and other skins		8,610				[g] 8,610
Whale oil	176,701	12,074			[h] 176,701	12,074
Total	53,707,004	1,107,087	38,965,460	450,419	92,672,464	1,557,506

[a] 26,360 bushels. [b] 21,362 bushels. [c] 772 bushels. [d] 1,485,861 bushels.
[e] In addition to the figures given for shells in the above table, which represent only the output of the shell beds in the Housatonic River, 41,290,000 pounds, valued at $33,032, were also handled, their value being included with that of the oysters when the latter were first disposed of.
[f] 130,000 bushels. [g] The value of 1,326 seal and other skins. [h] 23,560 gallons.

THE VESSEL FISHERIES.

The fishing fleet of Connecticut is next in size to the fleets of Massachusetts and Maine, and is noteworthy for a larger number of steam vessels than is found elsewhere in the fisheries of the United States. The vessel fisheries of Connecticut of special importance are those for bluefish, cod, halibut, red snapper, menhaden, lobsters, and oysters, the last named being the most extensive fishery in the State. The red-snapper fishery is prosecuted off the coast of Florida. Detailed tables exhibiting almost every phase of the vessel fisheries are presented.

There are three counties in Connecticut from which vessel fisheries are carried on, viz, New London, New Haven, and Fairfield, each of which has fisheries of considerable prominence.

The first table of the county series shows 1,062 persons employed on vessels, of whom 557 belong in New London County, 273 in New Haven County, and 232 in Fairfield County. Of the different nationalities represented by the fishermen the United States greatly predominates, with 916 men, or 86.2 per cent, after which come Portugal with 52 men or 4.9 per cent; Sweden and Norway, with 61 men or 5.8 per cent; British Provinces with 26 men or 2.4 per cent, and other countries with 7 men or 0.7 per cent.

The next table shows 200 fishing vessels and 14 transporting vessels engaged in the fisheries of Connecticut in 1889. These, with their outfit and apparatus, were valued at $696,921.

The fishing vessels of New London County, 86 in number, use chiefly seines, lines, and pots; in New Haven and Fairfield counties dredges are the principal form of apparatus.

The vessel fisheries of the State yielded 53,707,004 pounds of products, valued, at first hands, at $1,107,087. New London County is credited with the largest quantity of products, and Fairfield County with the smallest catch, although the output of the fisheries of New Haven County is of greater value than that of the two other counties combined, owing to the relatively high price of oysters, which are practically the only products of the county, constituting 99 per cent of the yield in this as in Fairfield County.

113.—Table showing by counties the number and nationality of persons engaged in the vessel fisheries of Connecticut in 1889.

Counties.	Number and nationality of men on fishing vessels.							Number and nationality of men on transporting vessels.		
	Americans.	Portuguese.	Swedes.	Norwegians.	British provincials.	All others.	Total.	Americans.	Swedes.	Total.
New London	444	42	33	6	12	4	541	15	1	16
New Haven	235	5	9	.....	8	.....	257	16	.....	16
Fairfield	206	5	12	.....	6	3	232	.....	.....	.....
Total	885	52	54	6	26	7	1,030	31	1	32

114.—Table showing by counties the number, value, and net tonnage of vessels and the quantity and value of apparatus of capture employed in the vessel fisheries of Connecticut in 1889.

Counties.	Vessels.							
	Fishing.				Transporting.			
	No.	Net tonnage.	Value.	Value of outfit.	No.	Net tonnage.	Value.	Value of outfit.
New London	86	2,485.96	$152,805	$81,050	7	128.58	$6,560	$1,050
New Haven	41	1,302.97	200,850	26,080	7	88.50	6,835	1,000
Fairfield	73	1,263.67	158,500	27,522	.....	.....	.....	.....
Total	200	5,052.60	512,155	134,652	14	217.08	13,395	2,050

Counties.	Apparatus of capture.										Total investment.
	Seines.		Lines.		Pots.		Harpoons.		Dredges, etc.		
	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	
New London	10	$4,070	.....	$990	1,785	$5,240	20	$240	.....	.....	$252,005
New Haven	2	950	.....	.....	.....	.....	.....	.....	.....	$14,470	250,185
Fairfield	.....	.....	.....	5	.....	.....	2	24	.....	8,680	194,731
Total	12	5,020	.....	995	1,785	5,240	22	264	.....	23,150	696,921

115.—Table showing by counties the yield of the vessel fisheries of Connecticut in 1889.

Species.	New London.		New Haven.		Fairfield.		Total.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Bluefish, fresh	453,326	$22,970					453,326	$22,970
Cod, fresh	1,523,418	49,696					1,523,418	49,696
Flounders, fresh	7,780	177					7,780	177
Haddock, fresh	199,290	5,309					199,290	5,309
Hake, fresh	900	15					900	15
Halibut, fresh	264,890	20,293					264,890	20,293
Mackerel, fresh	24,370	2,175			1,800	$156	26,170	2,331
Mackerel, salted	16,100	1,539					16,100	1,539
Menhaden, fresh	39,138,834	82,412	2,200,000	$4,400			41,338,834	86,812
Pollock, fresh	17,400	365					17,400	365
Red snapper, fresh	520,000	16,800					520,000	16,800
Sea bass, fresh	209,245	13,595					209,245	13,595
Squeteague, fresh	2,165	105					2,165	105
Swordfish, fresh	135,452	7,905			10,738	380	146,190	8,285
Tautog, fresh	21,340	947					21,340	947
Lobsters	446,890	26,064					446,890	26,064
Quahogs	3,600	400					3,600	400
Oysters			6,201,657	582,925	2,131,108	247,775	8,332,765	830,700
Seal and other skins		*8,610						8,610
Whale oil	176,701	12,074					176,701	12,074
Total	43,161,701	271,451	8,401,657	587,325	2,143,646	248,311	53,707,004	1,107,087

*1,326 skins.

The superiority of the vessels in New Haven County is brought out in the following table giving certain average figures for the vessel fisheries of Connecticut:

116.—Table showing by counties certain average figures for the vessels employed in the fisheries of Connecticut in 1889.

Counties.	Net tonnage.	Value per ton.	Value per vessel.	Value of apparatus and outfit.	No. of men to vessel.	Value of catch per man.	Value of catch per vessel.	Value of catch per each ton employed.	Value of catch per each $100 invested in fishing vessels.
New London	29.18	$62	$1,807	$1,086	6	$537	$3.231	$110	$112
New Haven	31.78	154	4,899	1,012	6	2,285	14,325	451	242
Fairfield	17.31	125	2,171	496	3	1,070	3,401	196	127

The statistics of vessel fisheries of Connecticut are next considered by customs districts, the vessels being credited to the districts in which their fishing licenses are obtained. Vessels are enrolled for the fisheries in four districts, the extent of the industry in each of which is shown in the two following tables. A table giving certain averages for each district is also presented.

117.—Summary by customs districts of the vessel fisheries of Connecticut in 1889.

Customs districts.	No. of vessels fishing.	Net tonnage.	Value of vessels.	Value of outfit, gear, provisions, fuel, etc.	Number and nationality of fishermen.							Value of catch.
					Americans.	Portuguese.	Swedes.	Norwegians.	British provincials.	All others.	Total.	
Stonington ..	47	1,302.39	$96,165	$50,480	240	5	10	2	2	2	261	$139,399
New London.	39	1,183.57	56,640	41,110	204	37	23	4	10	2	280	132,052
New Haven..	41	1,302.97	200,850	41,500	235	5	9	.....	8	.....	257	587,325
Fairfield.....	73	1,263.67	158,500	36,231	206	5	12	.....	6	3	232	248,311
Total ...	200	5,052.60	512,155	169,321	885	52	54	6	26	7	1,030	1,107,087

Customs districts.	No. of vessels transporting.	Net tonnage.	Value of vessels.	Value of outfit, provisions, fuel, etc.	Number and nationality of crew.							Value of products transported.
					Americans.	Portuguese.	Swedes.	Norwegians.	British provincials.	All others.	Total	
Stonington ..	5	92.83	$5,160	$800	11	.....	1	.....	.....	.....	12	$11,301
New London.	2	35.75	1,400	250	4	.....	.....	.....	.....	.....	4	10,800
New Haven..	7	88.50	6,835	1,000	16	.....	.....	.....	.....	.....	16	14,528
Fairfield.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total ...	14	217.08	13,395	2,050	31	.....	1	.....	.....	.....	32	36,629

118.—Table showing by species and customs districts the yield of the vessel fisheries of Connecticut in 1889.

Species.	Stonington.		New London.		New Haven.		Fairfield.		Total.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Bluefish, fresh	99,500	$4,885	353,826	$18,085	.....	.....	.....	.....	453,326	$22,970
Cod, fresh.....	769,700	25,928	753,718	23,768	.....	.....	.....	.....	1,523,418	49,696
Flatfish and flounders, fresh	2,000	50	5,780	127	.....	.....	.....	.....	7,780	177
Haddock, fresh	81,500	2,294	117,790	3,015	.....	.....	.....	.....	199,290	5,309
Hake, fresh.....	900	15	.....	.....	.....	.....	.....	.....	900	15
Halibut, fresh	125,890	9,373	139,000	10,920	.....	.....	.....	.....	264,890	20,293
Mackerel, fresh	3,050	320	21,320	1,855	.....	.....	1,800	$156	26,170	2,331
Mackerel, salted ...	16,100	1,539	.....	.....	.....	.....	.....	.....	16,100	1,539
Menhaden, fresh ...	20,300,137	42,731	18,838,697	39,681	2,200,000	$4,400	.....	.....	41,338,834	86,812
Pollock, fresh.....	9,400	185	8,000	180	.....	.....	.....	.....	17,400	365
Red snapper, fresh.	445,000	14,000	75,000	2,800	.....	.....	.....	.....	520,000	16,800
Sea bass, fresh	112,600	7,776	96,645	5,819	.....	.....	.....	.....	209,245	13,595
Squeteague, fresh..	.....	.....	2,165	105	.....	.....	.....	.....	2,165	105
Swordfish, fresh....	34,156	1,854	101,296	6,051	.....	.....	10,738	380	146,190	8,285
Tautog, fresh	11,440	510	9,900	437	.....	.....	.....	.....	21,340	947
Lobsters.....	350,350	20,288	96,540	5,776	.....	.....	.....	.....	446,890	26,064
Quahogs.....	.....	.....	3,600	400	.....	.....	.....	.....	3,600	400
Oysters.....	.....	.....	.....	.....	6,201,657	582,925	2,131,108	247,775	8,332,765	830,700
Seal and other skins	.....	.....	.....	8,610	.....	.....	.....	.....	.....	8,610
Whale oil.....	91,651	7,651	85,050	4,423	.....	.....	.....	.....	176,701	12,074
Total	22,453,374	139,399	20,708,327	132,052	8,401,657	587,325	2,143,646	248,311	53,707,004	1,107,087

119.—Table showing by customs districts the average tonnage, value, crew, and stock of vessels employed in the fisheries of Connecticut in 1889.

Customs districts.	Average tonnage.		Average value.		Average value of outfit and apparatus.		Average number of crew.		Average gross stock.	
	Fishing.	Transporting.	Fishing.	Transporting.	Fishing.	Transporting.	Fishing.	Transporting.	Fishing.	Transporting.*
Stonington	27.71	18.57	$2,046	$1,032	$1,074	$160	6	2	$2,966	$2,260
New London	30.35	17.88	1,452	700	1,054	125	6	2	3,569	5,400
New Haven	31.78	12.64	4,899	976	1,012	143	6	2	14,325	2,075
Fairfield	17.31	.....	2,171	.....	496	.....	3	.....	3,401	.....

* The value of products transported.

The quantity and value of fish taken in each form of apparatus are shown in the next tabulation. Lines yield the largest money returns, but seines secure the greatest quantities of fish.

120.—Table showing by apparatus and species the yield of the vessel fisheries of Connecticut in 1889, exclusive of the molluscan, crustacean, and mammalian fisheries.

Apparatus and species.	Pounds.	Value.	Apparatus and species.	Pounds.	Value.
Seines:			Lines—continued.		
Mackerel, salted	13,800	$1,239	Mackerel, salted	2,300	$300
Menhaden, fresh	41,338,834	86,812	Pollock, fresh	17,400	365
			Red snapper, fresh	520,000	16,800
Total	41,352,634	88,051	Sea bass, fresh	209,245	13,595
			Squeteague, fresh	2,165	105
Lines:			Tautog, fresh	21,340	947
Bluefish, fresh	453,326	22,970			
Cod, fresh	1,523,418	49,696	Total	3,248,224	132,903
Flatfish and flounders, fresh	7,780	177			
Haddock, fresh	199,290	5,309	Harpoons:		
Hake, fresh	900	15	Swordfish, fresh	146,190	8,285
Halibut, fresh	264,890	20,293			
Mackerel, fresh	26,170	2,331	Grand total	44,747,048	229,239

From Table 121, giving the full extent of each fishery in which the vessels of Connecticut engaged, it will be seen that mollusks, of which the oyster was chief, were the objects of capture by more vessels than any other product; 113 vessels were so employed. The shore fishery was followed by 37 vessels, the lobster fishery by 22 vessels, and the market fishery for cod, haddock, bluefish, sea bass, etc., by 27 vessels. The other fisheries had from 4 to 11 vessels each. As previously explained in discussing similar tables, the object of such a presentation is to exhibit the greatest number of vessels engaged in each fishery during any portion of the year, together with their tonnage, value, and crew, all of which items are duplicated to the extent to which each vessel follows two or more fisheries. The catch, however, is not duplicated, and represents simply the results obtained in each fishery.

The market fishery, according to Table 122, yields a larger stock than any other fishery except the oyster, the 27 vessels therein employed taking products to the value of $104,072, an average of $3,855 per vessel. The menhaden fishery comes next, with $86,812, or $14,469 per vessel. The vessels in the shore fishery stocked $26,360, or $713 each; while $26,064 resulted from the lobster fishery, the vessels earning $1,185 each. The 113 vessels composing the oyster and clam fleet took products to the value of $831,100, averaging $7,355.

121.—Table showing the number of vessels engaged in each fishery in Connecticut in 1889, together with their tonnage, value, and number of crew.

Fisheries.	No. of vessels.	Net tonnage.	Value of vessels.	Number and nationality of crew.						
				Americans.	British provincials.	Portuguese.	Swedes.	Norwegians.	Others.	Total.
Market	27	1,022.44	$62,600	138	5	23	26	2	3	197
Shore	37	481.84	31,330	104	.....	2	3	.....	2	111
Mackerel	9	160.40	11,650	26	7	1	.....	3	.....	37
Menhaden	6	451.80	61,500	124	1	.....	.....	.....	.....	125
Swordfish	11	186.86	13,150	35	.....	3	.....	.....	1	39
Crustacean	22	261.18	18,915	59	.....	.....	3	.....	.....	62
Molluscan	113	2,326.89	319,150	372	13	10	21	.....	3	419
Whale and seal	4	402.33	15,000	45	6	16	1	.....	1	69

122.—Table showing by fisheries and species the yield of the vessel fisheries of Connecticut in 1889.

Fisheries and species.	Pounds.	Value.	Fisheries and species.	Pounds.	Value.
Market:			Mackerel:		
Bluefish, fresh	436,396	$21,603	Mackerel, fresh	26,170	$2,331
Cod, fresh	1,267,000	41,129	Mackerel, salted	16,100	1,539
Haddock, fresh	140,500	3,719	Swordfish, fresh	456	24
Hake, fresh	900	15			
Halibut, fresh	264,750	20,281	Total	42,726	3,894
Pollock, fresh	17,400	365			
Red snapper, fresh	520,000	16,800	Menhaden, fresh	41,338,834	86,812
Swordfish, fresh	2,550	160	Swordfish, fresh	143,184	8,101
			Lobster	446,890	26,064
Total	2,649,496	104,072			
			Molluscan:		
Shore:			Oysters	8,332,765	830,700
Bluefish, fresh	16,930	1,367	Quahogs	3,600	400
Cod, fresh	256,418	8,567			
Flatfish and flounders, fresh	7,780	177	Total	8,336,365	831,100
Haddock, fresh	58,790	1,590			
Halibut, fresh	140	12	Whale and seal:		
Sea bass, fresh	209,245	13,595	Seal and other skins	.....	8,610
Squeteague, fresh	2,165	105	Whale oil	176,701	12,074
Tautog, fresh	21,340	947			
			Total	176,701	20,684
Total	572,808	26,360			
			Grand total	53,707,004	1,107,087

THE SHORE FISHERIES.

The shore fisheries of Connecticut, as gauged by the value of the products, are, as a whole, of less importance than those of Rhode Island, although special branches are of greater extent, among which the shad, oyster, and lobster fisheries may be mentioned. The statistics show the fisheries by counties and by apparatus.

There are four counties in Connecticut from which shore fishing is carried on; these are New London, Middlesex, New Haven, and Fairfield, each of which excels in certain features or branches, as brought out in the following series of tables.

Of 1,252 shore fishermen in the State, 546 were employed in Fairfield County, 277 in New Haven County, 247 in New London County, and 182 in Middlesex County.

New London County had the largest investment in the shore fisheries, viz, $51,926, closely followed by Fairfield County with $50,129; New Haven and Middlesex counties had, respectively, $35,542 and $33,011. Boats represent more than half the aggregate value of the property in the shore fisheries, and pound nets constitute the most important and valuable form of apparatus.

The shore fisheries yielded 38,965,460 pounds, which were sold for $450,419. Fairfield County took 12,250,056 pounds, valued at $174,685, of which 7,800,000 pounds represented oyster shells obtained from the Housatonic River and used by oyster-planters in preparing beds. The oysters secured amounted to 1,063,769 pounds (or 151,967 bushels), for which $121,122 was received. The next most important product was the quahog or round clam, of which 124,480 pounds (or 15,560 bushels), valued at $15,710, were marketed. The output of soft clams was also considerable, having a value of $6,990. The molluscan fisheries of this county are thus seen to be the most extensive. New Haven County ranks second in quantity and value of products, taking 9,830,186 pounds, worth $133,303. Oysters and clams are also the most important species in this county, $104,680 accruing from their sale. The catch of menhaden is the only other noteworthy feature of the shore fisheries of the county; 6,306,486 pounds of this species, with a value of $13,010, were taken. New London County is credited with 9,381,109 pounds, worth $95,740. In this county shellfish form an inconspicuous part of the product, the output being less than in any other county; the yield of

lobsters is greater than in all the other counties combined, being 887,700 pounds, valued at $45,355. The bulk of the catch consists of algæ. Middlesex County takes the largest quantities of eels and shad. The entire output of the county was 7,504,109 pounds, for which the fishermen received $46,691; of this quantity 6,500,000 pounds were algæ.

123.—Table showing by counties the number of persons engaged in the shore fisheries of Connecticut in 1889.

Counties.	No.
New London	247
Middlesex	182
New Haven	277
Fairfield	546
Total	1,252

124.—Table showing by counties the apparatus employed in the shore fisheries of Connecticut in 1889.

Designation.	New London.		Middlesex.		New Haven.		Fairfield.		Total.	
	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.
Boats	259	$21,235	174	$8,015	272	$23,280	648	$46,065	1,353	$98,595
Seines	8	400	2	100	3	120	30	2,110	43	2,730
Pound nets	51	10,700	36	17,400	26	9,700	.....	.....	113	37,800
Gill nets	20	150	22	1,760	10	154	10	460	62	2,524
Fyke nets	364	1,790	21	105	17	85	38	250	440	2,230
Lines	.....	110	.....	20	.....	60	.....	90	.....	280
Pots	5,182	14,361	2,734	2,886	1,169	1,578	686	894	9,771	19,719
Spears	.....	110	.....	60	.....	15	.....	20	.....	205
Dredges, rakes, etc	.....	3,070	.....	2,665	.....	550	.....	240	.....	6,525
Total	.....	51,926	.....	33,011	.....	35,542	.....	50,129	.....	170,608

125.—Table showing by counties and species the yield of the shore fisheries of Connecticut in 1889.

Species.	New London.		Middlesex.		New Haven.		Fairfield.		Total.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Alewives, fresh	3,280	$165	41,392	$280	8,600	$225	.....	.....	53,272	$670
Bluefish, fresh	32,520	1,823	.....	.....	12,300	950	18,810	$1,640	63,630	4,413
Butter-fish, fresh	35,000	914	.....	.....	7,400	150	.....	.....	42,400	1,064
Cod, fresh	6,445	322	.....	.....	.....	.....	.....	.....	6,445	322
Cunners, fresh	.....	.....	5,000	200	.....	.....	.....	.....	5,000	200
Eels, fresh	139,900	8,295	116,750	10,080	15,500	1,340	43,000	5,215	315,150	24,930
Flatfish and flounders, fresh	526,000	10,363	8,200	170	4,500	100	87,500	2,195	626,200	12,828
Frostfish or tomcod, fresh	21,600	500	.....	.....	.....	.....	101,900	4,375	123,500	4,875
Haddock, fresh	6,300	290	.....	.....	.....	.....	.....	.....	6,300	290
Mackerel, fresh	7,330	980	.....	.....	.....	.....	.....	.....	7,330	980
Menhaden, fresh	19,167	89	327,227	658	6,306,486	13,010	.....	.....	6,652,880	13,757
Salmon, fresh	.....	.....	260	204	20	18	.....	.....	280	222
Sea bass, fresh	7,856	656	10,800	640	11,000	780	11,300	970	40,956	3,046
Scup, fresh	6,800	170	.....	.....	.....	.....	.....	.....	6,800	170
Shad, fresh	1,925	87	141,880	11,979	19,147	1,515	32,900	2,999	195,852	16,580
Smelt, fresh	11,200	850	.....	.....	.....	.....	1,600	192	12,800	1,042
Squetengue, fresh	172,340	6,443	.....	.....	14,000	690	18,140	1,060	204,480	8,193
Striped bass, fresh	24,970	2,470	1,000	80	1,500	100	11,300	780	38,770	3,430
Tautog, fresh	140,300	6,525	25,000	1,250	27,600	1,430	24,400	1,200	217,300	10,405
Whiting, fresh	11,640	174	.....	.....	.....	.....	.....	.....	11,640	174
Miscellaneous fish, fresh	92,360	469	142,000	535	72,500	855	.....	.....	306,860	1,859
Lobsters	887,700	45,355	61,000	3,380	88,000	6,600	17,700	1,700	1,054,400	57,035
Crabs	8,300	300	.....	.....	.....	.....	.....	.....	8,300	300
Terrapin	.....	.....	.....	.....	.....	.....	3,057	1,280	3,057	1,280
Clams (soft)	12,600	1,530	62,000	7,200	101,500	9,180	87,500	6,990	263,600	24,900
Quahogs	456	99	.....	.....	42,360	4,905	124,480	15,710	167,296	20,714
Scallops	.....	.....	.....	.....	.....	.....	2,700	230	2,700	230
Oysters	15,120	4,165	61,600	9,225	927,773	90,595	1,063,769	121,122	2,068,262	225,107
Oyster shells	.....	.....	.....	.....	.....	.....	7,800,000	6,500	7,800,000	6,500
Algæ	7,190,000	2,706	6,500,000	810	2,170,000	860	2,800,000	527	18,660,000	4,903
Total	9,381,109	95,740	7,504,109	46,691	9,830,186	133,303	12,250,056	174,685	38,965,460	450,419

The quantities and values of products taken in each of the principal forms of apparatus employed in the shore fisheries are shown in the next table. Pound nets and trap nets are the most important means of capture employed in taking fish proper; the yield was 7,556,665 pounds, worth $43,288. Lines rank next as far as the value of the fish is concerned, but fyke nets catch larger quantities of fish. If lobsters are considered, pots produce larger returns than pound nets and trap nets, the stock in 1889 being $71,450. Dredges, tongs, rakes, and other miscellaneous apparatus naturally secured the largest quantities of products, which consisted chiefly of shellfish.

126.—Table showing by counties and apparatus the yield of the shore fisheries of Connecticut in 1889.

Apparatus and species.	New London.		Middlesex.		New Haven.		Fairfield.		Total.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Pound nets and trap nets:										
Alewives, fresh	3,280	$165	39,392	$265	8,600	$225	.....	.....	51,272	$655
Bluefish, fresh	7,550	391	.....	.....	.....	.....	.....	.....	7,550	391
Butter-fish, fresh	35,000	914	.....	.....	7,400	150	.....	.....	42,400	1,064
Cod, fresh	45	2	.....	.....	.....	.....	.....	.....	45	2
Flatfish and flounders, fresh	183,900	3,551	7,000	140	.....	.....	.....	.....	190,900	3,691
Frostfish, fresh	600	15	.....	.....	.....	.....	55,000	$2,500	55,600	2,515
Mackerel, fresh	4,330	620	.....	.....	.....	.....	.....	.....	4,330	620
Menhaden, fresh	18,667	87	327,227	658	6,209,986	12,575	.....	.....	6,555,880	13,320
Salmon, fresh	.....	.....	260	204	20	18	.....	.....	280	222
Scup, fresh	6,800	170	.....	.....	.....	.....	.....	.....	6,800	170
Sea bass, fresh	2,006	201	.....	.....	.....	.....	.....	.....	2,006	201
Shad, fresh	1,925	87	89,730	7,847	15,997	1,255	.....	.....	107,652	9,189
Squeteague, fresh	164,000	5,865	.....	.....	6,000	240	.....	.....	170,000	6,105
Striped bass, fresh	24,350	2,410	.....	.....	.....	.....	.....	.....	24,350	2,410
Tautog, fresh	19,100	700	.....	.....	.....	.....	.....	.....	19,100	700
Whiting, fresh	11,640	174	.....	.....	.....	.....	.....	.....	11,640	174
Miscellaneous, fresh	92,360	469	142,000	535	72,500	855	.....	.....	306,860	1,859
Total	575,553	15,821	605,609	9,649	6,320,503	15,318	55,000	2,500	7,556,665	43,288
Seines:										
Alewives, fresh	.....	.....	2,000	15	.....	.....	.....	.....	2,000	15
Bluefish, fresh	.....	.....	.....	.....	.....	.....	3,060	205	3,060	205
Eels, fresh	.....	.....	.....	.....	.....	.....	100	10	100	10
Flatfish and flounders, fresh	.....	.....	.....	.....	.....	.....	13,500	310	13,500	310
Frostfish, fresh	.....	.....	.....	.....	.....	.....	9,400	350	9,400	350
Shad, fresh	.....	.....	.....	.....	3,150	260	18,900	1,719	22,050	1,979
Smelt, fresh	9,000	700	.....	.....	.....	.....	1,600	192	10,600	892
Squeteague, fresh	400	25	.....	.....	.....	.....	6,440	395	6,840	420
Striped bass, fresh	.....	.....	400	35	.....	.....	6,050	450	6,450	485
Total	9,400	725	2,400	50	3,150	260	59,050	3,631	74,000	4,666
Gill nets:										
Bluefish, fresh	870	77	.....	.....	4,000	200	500	35	5,370	312
Menhaden, fresh	500	2	.....	.....	30,000	60	.....	.....	30,500	62
Shad, fresh	.....	.....	52,150	4,132	.....	.....	14,000	1,280	66,150	5,412
Squeteague, fresh	7,940	553	.....	.....	6,000	300	300	15	14,240	868
Striped bass, fresh	620	60	.....	.....	.....	.....	.....	.....	620	60
Total	9,930	692	52,150	4,132	40,000	560	14,800	1,330	116,880	6,714
Fyke nets:										
Flatfish and flounders, fresh	325,700	6,429	1,200	30	4,500	100	16,000	340	347,400	6,899
Frostfish, fresh	21,000	485	.....	.....	.....	.....	5,000	175	26,000	660
Menhaden, fresh	.....	.....	.....	.....	66,500	375	.....	.....	66,500	375
Striped bass, fresh	.....	.....	600	45	1,500	100	5,250	330	7,350	475
Tautog, fresh	8,000	350	.....	.....	.....	.....	.....	.....	8,000	350
Total	354,700	7,264	1,800	75	72,500	575	26,250	845	455,250	8,759

126.—Table showing by counties and apparatus the yield of the shore fisheries of Connecticut in 1889—Cont'd.

Apparatus and species.	New London.		Middlesex.		New Haven.		Fairfield.		Total.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Lines:										
Bluefish, fresh	24,100	$1,355	.....	.....	8,300	$750	15,250	$1,400	47,650	$3,505
Cod, fresh	6,400	320	.....	.....	.....	.....	.....	.....	6,400	320
Cunners, fresh	.....	.....	5,000	$200	.....	.....	.....	.....	5,000	200
Flatfish and flounders, fresh	12,000	290	.....	.....	.....	.....	44,000	1,225	56,000	1,515
Frostfish, fresh	.....	.....	.....	.....	.....	.....	32,500	1,350	32,500	1,350
Haddock, fresh	6,300	290	.....	.....	.....	.....	.....	.....	6,300	290
Mackerel, fresh	3,000	360	.....	.....	.....	.....	.....	.....	3,000	360
Sea bass, fresh	5,850	455	10,800	640	11,000	780	11,300	970	38,950	2,845
Smelt, fresh	2,200	150	.....	.....	.....	.....	.....	.....	2,200	150
Squeteague, fresh	.....	.....	.....	.....	2,000	150	11,400	650	13,400	800
Tautog, fresh	113,200	5,475	25,000	1,250	27,600	1,430	24,400	1,200	190,200	9,355
Total	173,050	8,695	40,800	2,090	48,900	3,110	138,850	6,795	401,600	20,690
Spears:										
Eels, fresh	91,000	5,700	33,000	3,320	8,400	780	6,500	705	138,900	10,505
Flatfish and flounders, fresh	4,400	93	.....	.....	.....	.....	14,000	320	18,400	413
Total	95,400	5,793	33,000	3,320	8,400	780	20,500	1,025	157,300	10,918
Pots:										
Eels, fresh	48,900	2,595	83,750	6,760	7,100	560	36,400	4,500	176,150	14,415
Lobsters	887,700	45,355	61,000	3,380	88,000	6,600	17,700	1,700	1,054,400	57,035
Total	936,600	47,950	144,750	10,140	95,100	7,160	54,100	6,200	1,230,550	71,450
Miscellaneous:										
Crabs	8,300	300	.....	.....	.....	.....	.....	.....	8,300	300
Clams (soft)	12,600	1,530	62,000	7,200	101,500	9,180	87,500	6,990	263,600	24,900
Quahogs	456	99	.....	.....	42,360	4,905	124,480	15,710	167,296	20,714
Scallops	.....	.....	.....	.....	.....	.....	2,700	230	2,700	230
Oysters	15,120	4,165	61,600	9,225	927,773	90,595	1,063,769	121,122	2,068,262	225,107
Oyster shells	.....	.....	.....	.....	.....	.....	7,800,000	6,500	7,800,000	6,500
Terrapin	.....	.....	.....	.....	.....	.....	3,057	1,280	3,057	1,280
Algæ	7,190,000	2,706	6,500,000	810	2,170,000	860	2,800,000	527	18,660,000	4,903
Total	7,226,476	8,800	6,623,600	17,235	3,241,633	105,540	11,881,506	152,359	28,973,215	283,934
Grand total	9,381,109	95,740	7,504,109	46,691	9,830,186	133,303	12,250,056	174,685	38,965,460	450,419

The following table, made up from the foregoing, shows the great relative difference in the effectiveness of various forms of apparatus, and the marked dissimilarity which exists between the quantity and value of the fish and other products procured by the different means.

127.—Table showing the relative quantity and value of yield in each principal form of apparatus of capture employed in the shore fisheries of Connecticut in 1889.

Apparatus.	Percentage.	
	Quantity.	Value.
Seines	.19	1.04
Gill nets	.30	1.49
Pound nets and trap nets	19.39	9.61
Fyke nets	1.17	1.95
Hand and trawl lines	1.03	4.59
Pots	3.16	15.86
Spears	.40	2.42
Miscellaneous	74.36	63.04
Total	100.00	100.00

A table of averages and percentages is next given and discloses some interesting facts. The average value of catch for each man engaged in the shore fisheries varied from $256 in Middlesex County to $481 in New Haven County. The average stock for each $100 invested in boats ranged from $379 in Fairfield County to $583 in Middlesex County. The average value of catch per each $100 invested in apparatus has a wide range, from $187 in Middlesex County to $4,367 in Fairfield County, the fishermen in the latter county taking mostly products of a relatively high price with a comparatively inexpensive kind of apparatus. The percentage of the value of the catch with each form of apparatus is shown for the various counties.

128.—Table showing by counties certain averages and percentages of the shore fisheries of Connecticut in 1889

Counties.	Value of catch per each $100 invested in boats.	Value of catch per each $100 invested in apparatus.	Value of catch per each man employed.	Percentage of value of yield in principal forms of apparatus.								
				Total.	Pound nets and trap nets.	Seines.	Gill nets.	Fyke nets.	Lines.	Pots.	Spears.	Miscellaneous.
New London...	$452	$312	$388	100.00	16.53	.76	.72	7.59	9.08	50.08	6.05	9.19
Middlesex.....	583	187	256	100.00	20.66	.11	8.85	.16	4.48	21.72	7.11	36.91
New Haven....	572	1,084	481	100.00	11.49	.20	.42	.43	2.33	5.37	.59	79.17
Fairfield.....	379	4,367	320	100.00	1.43	2.08	.76	.48	3.89	3.55	.59	87.22

The relative importance of each species in the different counties is next exhibited, the figures presenting the percentage of the value of the various products to the total stock in each county.

129.—Table showing by counties the percentage of value of each species to the total yield of the shore fisheries of Connecticut in 1889.

Species.	New London.	Middlesex.	New Haven.	Fairfield.
Alewives, fresh	.17	.60	.17	.....
Bluefish, fresh	1.91	.....	.71	.94
Butter-fish, fresh	.96	.....	.11	.....
Cod, fresh	.34	.....	.....	.....
Cunners, fresh	.....	.43	.....	.....
Eels, fresh	8.66	21.59	1.01	2.99
Flatfish and flounders, fresh	10.83	.36	.07	1.26
Frostfish or tomcod, fresh	.52	.....	.....	2.50
Haddock, fresh	.30	.....	.....	.....
Mackerel, fresh	1.02	.....	.....	.....
Menhaden, fresh	.09	1.41	9.76	.....
Salmon, fresh	.....	.46	.01	.....
Sea bass, fresh	.68	1.35	.59	.56
Scup, fresh	.18	.....	.....	.....
Shad, fresh	.09	25.66	1.14	1.72
Smelt, fresh	.89	.....	.....	.11
Squeteague, fresh	6.73	.....	.52	.61
Striped bass, fresh	2.58	.17	.07	.45
Tautog, fresh	6.82	2.68	1.07	.69
Whiting, fresh	.18	.....	.....	.....
Miscellaneous fish, fresh	.49	1.14	.64	.....
Lobsters	47.37	7.24	4.95	.97
Crabs	.31	.....	.....	.....
Terrapin	.....	.....	.....	.73
Clams, soft	1.60	15.42	6.89	4.00
Quahogs	.10	.....	3.68	8.99
Scallops	.....	.....	.....	.13
Oysters	4.35	19.76	67.96	69.34
Oyster shells	.....	.....	.....	3.71
Algæ	2.83	1.73	.65	.30
Total	100.00	100.00	100.00	100.00

THE MENHADEN INDUSTRY.

Connecticut ranks next to Rhode Island in the extent of its menhaden industry. The four factories at which the crude fish are utilized employed 215 men as fishermen and shoresmen, and, with the necessary cash capital, were valued at $108,700. Six steam vessels and 4 sailing vessels were employed, the value of which was $73,655; giving, as the total amount of capital invested in this enterprise, $182,355. In 1889 37,360,700 menhaden were handled, the value of which was $52,927. The manufactured products had a market value of $99,066, an increase of $51,601 over 1887 and $30,536 over 1888.

130.—Table showing the extent of the menhaden industry of Connecticut in 1889.

Number of factories in operation	4
Value of factories	$83,200
Amount of cash capital	$25,500
Number of shoresmen employed	82
Number of fishermen employed	133
Number of steam vessels employed	6
Net tonnage	451.80
Value	$61,500
Value of outfit	$10,000
Number of sailing vessels employed as "carryaways"	4
Net tonnage	41.49
Value	$1,835
Value of outfit	$320
Number of menhaden handled	37,360,700
Value to fishermen	$52,927
Number of gallons of oil made	233,228
Value as sold	$53,110
Number of tons of scrap produced	2,893
Value as sold	$45,956