PART XI.

VIRGINIA AND ITS FISHERIES.

By MARSHALL McDONALD.

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PART XI.

VIRGINIA AND ITS FISHERIES.

A.—GENERAL REVIEW OF THE FISHERIES OF THE STATE.

160. STATISTICS OF THE COMMERCIAL FISHERIES.

THE VARIOUS FISHERY INTERESTS.—Virginia comes seventh in the list of fish-producing States. The oyster, menhaden, and shad fisheries are the three branches in which the citizens are most extensively interested. In the first-named fishery this State ranks second only to Maryland, having 16,315 persons employed, with products valued at $2,218,376. The menhaden fisheries are of recent origin, but they have developed with remarkable rapidity. In 1880 the fleet numbered one hundred and two sail, and the oil, scrap, and compost produced sold for $303,829; 88,213,800 pounds of menhaden were utilized in this way. The river fisheries are also important, furnishing employment to 2,641 persons. Over 3,000,000 pounds of shad and nearly 7,000,000 pounds of alewives, with many other river species, were taken, the whole having a value of $272,828.

STATISTICAL RECAPITULATION FOR 1880.—In the accompanying statements will be found a statistical recapitulation of the fisheries of the State:

Summary statement of persons employed.

Persons employed.	Number.
Fishermen	16,051
Shoremen	628
Factory hands	2,185
Total	18,864

Detailed statement of capital invested and apparatus employed.

Apparatus specified.	Number.	Value.
Vessels (15,578.93 tons)	1,446	$571,000
Boats	6,618	292,720
Pound-nets	185	98,390
Fykes, pots, and baskets	100	900
Gill-nets	3,532	35,220
Purse-seines	80	24,000
Drag-seines	73	46,970
Minor apparatus, including outfit	.....	355,283
Factories and other shore property	.....	489,636
Additional cash capital	.....	1,914,119
Total capital	.....	3,828,238

Detailed statement of the quantities and values of the products.

Products specified.	Pounds.	Value.
Grand total for fishery products	158, 874, 609	$3, 124, 444
Sea fisheries.		
Bluefish	1, 546, 417	36, 023
Clams (hard)	363, 820	18, 555
Crabs	2, 139, 200	32, 088
Menhaden	88, 213, 800	303, 829
Mullet	20, 000	800
Oysters	47, 861, 240	2, 218, 376
Spotted sea trout	369, 000	9, 930
Squeteague	1, 107, 000	19, 860
Terrapin	165, 600	18, 550
All other species	4, 336, 468	193, 605
Total sea products	146, 122, 545	2, 851, 616
River fisheries.		
Alewives	6, 925, 413	76, 300
Shad	3, 171, 953	134, 496
Sturgeon	411, 558	6, 973
All other species	2, 243, 140	55, 059
Total river products	12, 752, 064	272, 828

161. STATISTICS OF THE SEA FISHERIES, EXCLUSIVE OF THE MENHADEN AND OYSTER INTERESTS.

STATISTICAL RECAPITULATION FOR 1880.—The salt-water fisheries of the State, if we exclude the menhaden and oyster interests, which are very important, are confined chiefly to the capture of fish in nets, seines, and pounds along the bay shores and in the estuaries along the ocean shore. Clams, terrapin, and other species are taken in considerable numbers in many localities.

The following statements show the extent of the salt-water fisheries of the State for 1880:

Summary statement of persons employed.

Persons employed.	Number.
Fishermen	1, 411
Shoremen	20
Factory hands	318
Total	1, 749

Detailed statement of capital invested and apparatus employed.

Apparatus specified.	Number.	Value.
Vessels (172.90 tons)	17	$13, 750
Boats	1, 279	41, 752
Pound-nets	152	89, 240
Fykes, pots, and baskets	100	900
Gill-nets	2, 345	8, 640
Drag-seines	44	16, 598
Minor apparatus, including outfit	.....	15, 066
Factories and other shore property	.....	12, 150
Cash capital	.....	45, 000
Total capital	.....	243, 096

Detailed statement of the quantities and values of the products.

Products specified.	Pounds.	Value.
Bluefish	1,546,417	$36,623
Clams (hard)	363,820	18,555
Crabs	2,139,260	32,688
Mullet	20,000	800
Spotted sea trout	369,000	9,930
Squeteague	1,107,000	19,860
Terrapin	165,000	18,550
All other species	4,336,468	193,065
Total	10,047,505	329,431

B.—DESCRIPTION OF THE FISHERIES BY COUNTIES.

162. PRINCESS ANNE, NORFOLK, AND ELIZABETH CITY COUNTIES.

Princess Anne County was formed in 1669 from Norfolk. It is 30 miles long, with a mean breadth of 20 miles. It lies on the Atlantic Ocean, with Chesapeake Bay on the north, Norfolk County on the west, and North Carolina on the south. The surface is level, and the land generally good. On account of the mildness of the climate and the fertility of the soil, the people devote themselves principally to truck-farming, obtaining a ready market for their products in Baltimore and Norfolk. The watershed of the county drains to the south into Currituck Sound, on the west into Elizabeth River, and on the east into Lynn Haven Bay. The extensive coast-line of the county and the fresh-water swamps of the interior furnish abundant facilities for the development of important fishing industries. The greater profit to be derived from the cultivation of the soil, however, attracts to it all but a very small part of the population. On Straight Beach, which extends from Cape Henry to the North Carolina line, several seines are regularly fished by gangs of men from Norfolk. The product of these fisheries is carried in carts overland to Norfolk, and either sold to hucksters or hawked about the streets.

FISHERIES OF BAY SHORE AND SEASIDE IN PRINCESS ANNE AND NORFOLK COUNTIES.—From Sewell's Point, around Willoughby Point, to Cape Henry south, are two pounds and a number of haul-seines engaged in the spot fishing. Gray trout, salmon trout and tailors are also taken in considerable numbers, but spot constitute four-fifths of the catch and the motive of the fishing. The construction of the pounds presents nothing peculiar, but the mode of fishing the haul-seines is unique, so far as my observation has extended. The movement of the fish is up the beach in the spring of the year and down in the fall, without reference to the set of the currents. Again, the seine can only be hauled on the slack of the tide. It is put out on one slack and hauled on the next, and it is consequently anchored out during one tide. A single anchor at the end is all that is necessary when the tide bellies the seine. When the tide is against the back of the seine intermediate anchors are placed to keep the seine in position. The anchors are attached to the cork line and the bottom-line is very heavily leaded to prevent shifting. In fishing the seine, the sea end is first landed so as to inclose the fish, and is then beached as in the ordinary haul-seines. These seines are fished spring and fall; the fall fishing ending after the first big storm in October. These seines and outfits cost from $500 to $700, and average a crew of ten men and a captain.

Below is a statistical summary of these fisheries in part based upon estimates, but the exact data are given wherever they were accessible:

	Names of parties fishing in 1879.	Designation of fishing apparatus.	Catch.			Value of fish taken.	Value of fishing equipments.
			Spot.	Trout, tailors.	Mixed fish.		
			Bushels.	*Bushels.*	*Bushels.*		
1	Miles Taylor (Bushels Bluff)	Seine	150	250		$675	$500
2	McWhorter	Pound		150	150	375	700
3	Griffith (Willoughby Spit)	do			300	300	800
4	Taylor, W. E. (Signal St. Haul)	Seine	200	250	50	675	600
5	Leggett & Parkinson	do	400	100		1,200	700
6	Fisher & Williams	do	1,000	300	200	3,000	700
7	Major Bradford (Sand Hills)	do	900	400		2,400	800
8	George Smith (Pleasure House)	do	1,100	400	100	2,900	800
9	Spring Haul Stump Haul Charles E. Barton	One seine	2,000	1,200		6,000	800
10	Inlet Haul Josiah Garrison Swamp Haul	One seine	1,067	300		2,584	800
11	Ch. Point Haul (Josiah Garrison)	Seine	600	132		1,127	600
	The Herbert Hauls	do	600	200		1,500	500
12	Whitehurst & Godfrey (Cape Point)	do	500	300		1,450	600
13	Straight Beach	Three seines	900	500		2,509	1,500
			9,417	4,482	800	26,686	10,400

The seines average a crew of ten men, and one captain or foreman. The pounds are fished by one man and a boy. The menhaden and other offal fish, which are taken in large quantities both by seines and pounds, are not included in the above estimates. They are either sold on the beach for 15 cents a bushel or carted to the compost heap. The quantity of these may be safely estimated at 600 bushels for each seine and pound, or 7,800 bushels for the whole; and at 15 cents per bushel, $1,170, which is to be added to the above total.

The principal fish caught are the spot (*Liostomus xanthurus*) and the gray and salmon trout, all of which find a market in Norfolk. Menhaden, which are caught in considerable quantities in both seines and pounds, are carried out on the land and composted for fertilizers.

The number of men employed in the fisheries is one hundred and thirty-two; total capital invested, $13,198. The product of the fisheries is 644,340 pounds of fish, having a value of $17,735.

The waters of Lynn Haven Bay abound in hogfish, croakers, trout, and sheepshead, the pursuit of which gives occupation to a number of hook-and-line fishermen from Norfolk and Elizabeth City Counties. The bay is also a favorite resort for pleasure seekers passing the summer in the vicinity of Hampton Roads. Oyster planting is the most important fishing interest of the county. It is pursued in Lynn Haven River and its coves to the fullest extent possible.

NORFOLK COUNTY.—Norfolk County was formed in 1691 from Lower Norfolk. It lies on Hampton Roads between Nansemond and Princess Anne Counties and extends to the north line. It is 24 miles long, with a mean width of 19 miles. The surface is nearly level; soil sandy, with clay subsoil. Early vegetables for the Northern markets are raised in enormous quantities and bring a large amount of money into the county. In the southwestern part lies the Dismal Swamp, which, with Elizabeth River and its branches, furnishes ample drainage. On the bay shore, from Willoughby Point to Norfolk, a number of pounds and haul-seines are fished. The oysters of Elizabeth River and its branches, and those of Craney Island Flats, furnish occupation to a considerable number of

tongers. From the Elizabeth River and its branches, as well as from Nansemond, are taken during the fall and winter season very considerable quantities of rock and perch, which go to supply the local demand in Norfolk. To a much greater extent than in Princess Anne County the male population of Norfolk County (including the city of Norfolk) are engaged in fishing. Three thousand two hundred and seventy persons are engaged either in the hook-and-line fisheries, the seine fisheries, or the oyster fisheries, including those who find occupation in the carrying trade incident to the fish and trucking industries. The capital invested in boats, vessels, apparatus, &c., is $270,000. In Tanner's Creek and the Eastern Branch of Elizabeth River there are natural oyster beds, though excessive tonging has greatly reduced their yield. In both cases, however, planting is largely resorted to, and as a consequence the yield of cultivated oysters is beginning to amount to a very respectable figure. The city of Norfolk is the principal seaboard town of Virginia. Its population, including its suburbs, is 33,422. We quote from the work "A Hand-book of Virginia, by the State commissioner of agriculture," published in 1881:

"Norfolk, a port of entry, and the principal shipping and seaport town in Virginia, is 220 miles from the base of the Blue Ridge Mountains, and almost within hearing of the deep-toned roar of the Atlantic Ocean. Its unsurpassed harbor, which admits vessels of the largest size, and its close proximity to the ocean and Chesapeake Bay, make it the best shipping port for Virginia, North Carolina, and for a large portion of the great West and Southwest. It is the eastern terminus of the Norfolk and Western Railroad, which has connections with lines extending to the Mississippi, and will be in union with the Texas Pacific when that great thoroughfare is completed. The Seaboard and Roanoke Railroad, the Norfolk, Elizabeth City and Edenton Railroad, now building; and the Albemarle and Chesapeake Canal, the Dismal Swamp Canal, all terminate at Norfolk. Numerous steamboat lines connect Norfolk with New York, Baltimore, Richmond, &c., and the cities of Europe. The export trade of Norfolk in 1865 was only $11,538. It has gone on to increase until, in 1876, it was $7,825,112. In 1865 Norfolk exported no cotton; in 1866 there were exported 733 bales, and in 1876 106,421 bales were exported. The exports of cotton in 1876 and 1877 and since prove that Norfolk ranks as the *second* cotton port on the Atlantic coast. The coastwise trade for Norfolk and Portsmouth (the trade of these cities is usually considered as one) aggregated in 1876, entered and cleared, 2,178,781 tons, and in the bitter month of December, when all the ports of the North were obstructed with ice, we had 160,959 tonnage in coastwise trade. These interesting facts are collected from the Norfolk Landmark. We have before us an interesting *résumé* of the trade of Norfolk, published in a special edition of the Norfolk Virginian, and courteously furnished us by Mr. Glennan, the editor. The export trade of Norfolk for 1880 is an increase of $4,300,000 over that of 1878. The general wholesale trade is about $12,000,000, making a total trade of $38,000,000. The export of cotton alone was $13,787,209; that of cattle and sheep, $104,750. The lumber business is large and is estimated at $1,698,000. The number of foreign vessels entering the port in 1880 was forty-five, with a tonnage of 45,159; the number cleared for foreign ports was one hundred and eleven, with a tonnage of 114,579."

Ever since colonial times Norfolk has been the center of a large coasting trade. The close connection that it now has with Baltimore and other more northern cities gives a powerful impulse to the trucking business in the surrounding counties as far down the coast as New Berne, N. C., all the products of which gravitate to Norfolk, whence they are sent by railroad and steamer to the northern cities. The establishment of through railroad connections with the South has of late years made it a principal point also for shipping cotton. As to the fishing trade, it is the natural center of the fishing industries of all the lower Chesapeake, and the entrepot for the

fish taken in the pound-nets of the eastern shore, and of the very extensive pound-net fisheries that cluster around New Point, Va. The spot seine fisheries of the bay shore, the fresh-water fisheries of the bays and swamps that lie around the head of Currituck Sound and Elizabeth River, and the large shad and herring fisheries of the Albemarle, Pamlico, and Croatan Sounds all send their products to the same place. Among the principal dealers in Norfolk engaged in this business are O. E. Maltby & Co., and Howard Brothers. The fish caught on the eastern shore and those coming from New Point reach Norfolk by sailing vessels. The product of the spot seines of the bay shore go by carts across the country, while the great fisheries of the Albemarle and Croatan utilize the Seaboard and Roanoke Railroad, the Albemarle and Chesapeake Canal, and the Dismal Swamp Canal for the same purpose. Norfolk is also becoming a formidable rival with Baltimore in the oyster-packing industry, and it is probable that when she possesses direct and prompt connection with the West she will equal, if not outstrip, the latter city. At present the oysters shucked in Norfolk go almost exclusively to the Northern and Northeastern States. They are obtained, as a rule, from James River and its creeks and coves, and from the Rappahannock River. A small proportion of the supply is also obtained from the Broadwater on the ocean side of the eastern shore. The planting in the Nansemond, James, and Lynn Haven Rivers contribute a considerable proportion of the fancy stock which goes north in the shell to supply the restaurants.

ELIZABETH CITY COUNTY.—Elizabeth City County occupies the southern extremity of a narrow peninsula lying between the York and James Rivers. It fronts on Hampton Roads and the Chesapeake Bay, and is intersected by numerous salt-water creeks. The surface is level and the soil fertile; some of it is highly so. The population in 1880 was 10,792, an increase of 25 per cent. in 10 years. "Trucks" are considerably raised. The following is a statistical summary of the fisheries and the industries dependent upon them:

Men employed in the canning of crabs	226
Men employed in the alewife fishery	130
Men employed in the oyster fishery	550
Men employed in the hook-and-line fishery	200
Total number employed in the fisheries	1,106
Money value of crab-canning	$16,800
Money value of menhaden fishery (oil and scrap)	31,620
Money value of hook-and-line fishery	7,500
Product of oyster industry (in bushels):	
From the rocks	317,000
From plants	30,000
Total number of bushels produced	347,000
Money value of the oyster fisheries	$69,400
Money value of diamond-back terrapins	1,400

RECAPITULATION.

Value of crab-canning	$16,800
Value of menhaden fisheries	31,620
Value of hook-and-line fisheries	7,500
Value of oyster fisheries	69,400
Value of terrapin fisheries	1,400
Total value of products of fisheries in Elizabeth City County	126,320

Hampton is the county-seat, and the only settlement of any size in the county. It is distinctively a fishing village, more than one-half of the population deriving their living from industries connected with the water. The large crab-canning firms of McMenamin & Co., and T. T. Bryce

give employment to a considerable number of men, women, and boys. The men and boys are employed in catching the crabs, and the women and children work in the factory. Back of Old Point, at the mouth of Back River, is the large menhaden factory of Darling & Smithers, probably the most extensive on Chesapeake Bay. It gives employment on the water or in the factory to one hundred and thirty men. The value of the annual product is $31,620.

Quite a number of diamond-back terrapins are taken in the swamps and rivers; they find a market at Old Point and Norfolk, or they are reshipped thence to Baltimore. The fish caught by hook and line are consumed mainly at the pleasure resorts lying around Hampton Roads, though some go to Norfolk. The section of the country termed the Poquosin is inhabited by a people who subsist entirely from the water. They are famous for the production of the canoe (locally known as kunners), a sailing craft hollowed out of logs and specially adapted to the mode of fishing pursued by these people. Oysters are planted quite extensively in Back River, Hampton Creek, and in Hampton Roads. Hampton Bar formerly yielded, from natural oyster-rocks, many thousand bushels of oysters, which had a great reputation in the restaurants, but the beds have now become practically exhausted. Twenty-five years ago two men with a boat could procure 30 or 40 bushels in a day. Now they could scarcely procure one or two.

163. YORK, GLOUCESTER, AND MATHEWS COUNTIES.

YORK COUNTY.—York County, which is 30 miles long and 5 wide, lies on Chesapeake Bay and York River. The surface is level and the soil sandy and moderately fertile. The country is drained by numerous creeks and coves, which abound in oysters, fish, and fowl. The population in 1880 was 7,351, of which 35 are regularly engaged in fishing and 604 in oystering. The product of the river and shore fisheries is 534,000 pounds, having a value of $22,592. The value of the oyster fisheries cannot be given, as the men of the county prosecute their work in the James and Rappahannock Rivers, and some even go as far as the Potomac. York River, which bounds the northern edge of the county, was once famous for its oyster-beds, but now these are practically exhausted. Planting to a considerable extent is pursued in this river, and the product now foots up to from 200,000 to 300,000 bushels annually, which find a market principally in Boston. The product of the fisheries in York County find their way to Yorktown and the neighboring landing of Gloucester Point, whence they are shipped by steamer to Baltimore and the northern markets.

GLOUCESTER COUNTY.—Gloucester County lies on the Chesapeake Bay and York River. The surface is level and the soil productive. It is 30 miles long and about 10 miles wide, and is deeply penetrated by salt-water creeks which drain into Mobjack Bay and York River. The population in 1880 was 11,678. The numerous creeks of the county formerly abounded in fish and oysters, but overfishing and the spoliation of the oyster beds have exhausted them to such an extent that it is no longer profitable to work them. The principal fishing interest is pound-net fishing for shad and Spanish mackerel, but large quantities of bluefish or tailors are also caught. The accompanying tables show the catch and value of the pound-net fisheries from York River to Piankatank River.

The number of men engaged in the fisheries proper in Gloucester County is eighty-seven; in the oyster fisheries, six hundred and forty-two. The capital invested is $18,600.

MATHEWS COUNTY.—Mathews County is a peninsula connected with the mainland by a narrow neck of land. It lies between the Piankatank River and Mobjack Bay. Its surface is dead level; the soil is light and sandy, but some is quite fertile. The population in 1880 was 7,507. The number of men employed in the river and shore fisheries is one hundred and seventy; number engaged in the oyster fisheries, six hundred and eighty.

At New Point is the guano factory of O. E. Maltby & Co., which gives employment in fishing

or in the factory work to fifty men. From the 6,000,000 menhaden annually handled are produced about 12,000 gallons of oil and 400 tons of guano. The capital invested in buildings and fixtures is about $10,000; in vessels and outfitting $4,800. Horn Harbor and Milford Haven, deep indentations in the coast, furnish extensive planting grounds for oysters as well as a safe harbor to a large number of tongers who work on the oyster beds of the Piankatank and Rappahannock.

The pound-net fisheries of York River and Mobjack Bay and the bay shore from New Point to the Piankatank are prosecuted in common by the citizens of York, Gloucester, and Mathews Counties. The following tables give the statistics of these fisheries for 1880:

TOO'S POINT POUNDS.

PERSONNEL AND EQUIPMENT.

Number of pounds.	Value.	Value of boats.	Number of men engaged in—	
			Fishing.	Carrying.
16	$9,600	$2,620	32	3

CATCH FOR 1879–'80.

Designation of fish.	Number.	Pounds.	Bushels.	Average price per pound.	Aggregate value.
				Cents.	
Shad	42,112	147,392		5½	$8,106 56
Spanish mackerel	64,000	96,000		12	11,520 00
The herrings (*C. vernalis* and *æstivalis*)	240,000				1,440 00
Jacks (*C. mediocris*)	21,000	42,000		1½	630 00
Bluefish	48,000	24,000		3	720 00
Sheepshead	2,400	12,000		6	720 00
Sturgeon	160	12,800		2	256 00
Miscellaneous fish not named, chiefly trout		80,000		2	1,600 00
Offal fish, used for manure			16,000		1,600 00
Total value					26,582 56

SUMMARY.

Men engaged in Too's Point fishery	35
Capital invested	$12,200 00
Aggregate annual return for these fisheries	26,582 56

YORK SPIT POUNDS.

PERSONNEL AND EQUIPMENT.

Number of pounds.	Value.	Value of boats.	Number of men engaged in—	
			Fishing.	Carrying.
31	$18,600	$4,875	78	0

CATCH FOR 1879–'80.

Designation of fish.	Number.	Pounds.	Bushels.	Average price per pound.	Aggregate value.
				Cents.	
Shad	80,592	282,072		5½	$15,513 96
Spanish mackerel	248,000	372,000		12	44,640 00
The herrings (*C. æstivalis* and *vernalis*)	775,000				4,650 00
Jacks (*C. mediocris*)	40,000	80,000		1½	1,200 00
Bluefish "tailors"	93,000	139,500		3	5,185 00
Sheepshead	4,650	23,250		6	1,395 00
Sturgeon	310	23,250		2	465 00
Miscellaneous fish, chiefly trout		155,000		2	3,100 00
Offal fish, used for manure			31,000		3,100 00
Total value					79,248 96

MOBJACK BAY POUNDS.

PERSONNEL AND EQUIPMENT.

Number of pounds.	Value.	Value of boats.	Number of men engaged in—	
			Fishing.	Carrying.
41	$16,400	$6,150	82	9

CATCH FOR 1879–'80.

Designation of fish.	Number.	Pounds.	Bushels.	Average price per pound.	Aggregate value.
				Cents.	
Shad	100,700	387,450	.....	5½	$21,300 75
Spanish mackerel	123,000	184,500	.....	12	22,140 00
The river herrings (*C. vernalis* and *æstivalis*)	492,000	.....	.....	.....	2,952 00
Jacks (*C. mediocris*)	90,200	180,000	.....	1½	1,353 00
Bluefish "tailors"	123,000	174,500	.....	3	5,235 00
Sheepshead	6,150	30,750	.....	6	1,845 00
Sturgeon	410	30,750	.....	2	615 00
Miscellaneous fish, chiefly trout	.....	205,000	.....	2	4,100 00
Offal fish, used for manure	.....	.....	41,000	.....	4,100 00
Total value	.....	.....	.....	.....	63,649 75

SUMMARY.

Men engaged in the pound-net fisheries of Mobjack Bay	91
Capital invested	$22,550 00
Aggregate return of these fisheries for 1880	63,649 75

POUNDS OF THE BAY SHORE FROM NEW POINT TO THE PIANKATANK RIVER.

PERSONNEL AND EQUIPMENT.

Number of pounds.	Value.	Value of boats.	Number of men engaged in—	
			Fishing	Carrying.
35	$21,000	$4,000	70	9

CATCH FOR 1879–'80.

Designation of fish.	Number.	Pounds.	Bushels.	Average price per pound.	Aggregate value.
				Cents.	
Shad	70,000	245,000	.....	5½	$13,475 00
Spanish mackerel	105,000	157,500	.....	12	18,900 00
The river herrings (*C. vernalis* and *æstivalis*)	675,000	.....	.....	.....	4,050 00
Jacks (*C. mediocris*)	49,000	98,000	.....	1½	1,470 00
Bluefish "tailors"	52,500	78,750	.....	3	2,362 00
Sheepshead	.....	.....	.....	.....	.....
Sturgeon	300	22,500	.....	2	450 00
Miscellaneous fish, chiefly trout	.....	87,500	.....	3	2,625 00
Offal fish, used for manure	.....	.....	31,500	.....	3,150 00
Total value	.....	.....	.....	.....	46,472 00

SUMMARY.

Men engaged in the pound-net fisheries from New Point to Piankatank River	79
Capital invested	$25,000
Aggregate returns for these fisheries for 1880	46,472

164. MIDDLESEX, LANCASTER, AND NORTHUMBERLAND COUNTIES.

MIDDLESEX COUNTY.—Middlesex County covers all the narrow peninsula lying between the Rappahannock and the Piankatank Rivers. It is 30 miles in length, with a mean breadth of about 5 miles. The surface is mostly level; the soil varies from sandy loam to stiff clay, and is very productive of corn, wheat, &c. The population in 1880 was 6,252. The Piankatank, which forms the southern boundary of the county, was formerly the seat of very productive fisheries, and the bed of the river was filled with natural deposits of oysters, but the introduction of pound-nets has almost destroyed the former, while excessive tonging and unlawful dredging has ruined the oyster beds. To some extent, however, the yield has been restored by plantings. The pound-nets extend all the way from the mouth of the Piankatank to Stingray Point. There are also a number of them in the Rappahannock, the larger proportion being on the north shore, as experience shows that the greater run of fish is on that side. The oyster beds of the Rappahannock give employment to a considerable number of tongers, and the numerous creeks and coves that drain into both the Rappahannock and Piankatank are filled to their utmost capacity with planted oysters.

The following summary will be of interest: Number of men engaged in the river and shore fisheries, 52; annual product river and shore fisheries, 165,000 pounds, chiefly shad, valued at $4,470. The number of men engaged in the oyster fisheries is 998; capital invested, $13,000. The product and value of the oyster fisheries cannot be given for the county separately. The menhaden fisheries give employment to 46 men, and have $15,000 invested in boats and fixtures. The product is 10,000,000 fish annually. For the conversion of these into oil and guano there are several kettle factories between the mouth of the Piankatank and the Rappahannock. The guano product in these kettle factories goes almost entirely to supply the local demand; but the process of manipulation is so imperfect that a very inferior article is produced.

LANCASTER COUNTY.—Lancaster County lies on the north bank of the Rappahannock River and has the Chesapeake Bay for a portion of its eastern boundary. The surface is mostly level. The soil, which is a sandy loam, is naturally unproductive, by liberal applications of fish chum is made to yield very fine crops. The county is drained by many creeks. The Moratico, Deep, Mud, Carter's, and Musquito Creeks, and the Corrotoma River are tributaries of the Rappahannock; while the Antipoisen, Tabb's, Dwyer's, Indian, and Little Bay are tributaries of Chesapeake Bay. They all furnish favorable planting grounds for oysters, and are stocked to their fullest capacity. As might be expected, a large proportion of the people engage in occupations connected with the water. Out of a total population of 6,145, there are 42 in the river and shore fisheries, 1,040 in the oyster fisheries, and 46 in the menhaden fisheries. The total product of the river and shore fisheries is 166,000 pounds, having a value of $3,528; that of the menhaden fisheries is 1,000 tons of fertilizers and 18,000 gallons of oil, possessing a value of $23,200. Most of the menhaden are taken in purse-nets fished by sailing vessels; there were seven menhaden factories in operation in 1880, the largest being that of Bussels & Co., situated in Carter's Creek.

NORTHUMBERLAND COUNTY.—Northumberland County is one of the five counties constituting the "Northern Neck" of Virginia, and has the Potomac River and Chesapeake Bay for its eastern boundary. It is 30 miles long and about 12 miles wide. The surface is mostly level, and the soil on the streams is a sandy loam, with clay subsoil, and is well adapted to wheat. As the county has no large fresh-water streams there is a total absence of shad fisheries, but quite a number of salt-water species, such as trout, tailors, rock, and perch, are taken in some of the many salt-water creeks that indent the coast line of the county. These fish, which are captured in small haul-seines, pounds, or gill-nets, are either consumed in the vicinity or find their way to

market by the tri-weekly line from Baltimore, which touches at several places in the county. This county contains more menhaden factories (and of larger size) than any other county on the Chesapeake. The creeks and coves along the bay shore were formerly filled with natural beds of oysters, but excessive tonging has everywhere diminished, and in many places exterminated, the supply. Where, however, the conditions of the bottom render it practicable artificial planting has been resorted to, and the product is now on the increase. The main fishing industry of the people, and that which yields the largest returns, is the menhaden fishery. The catch is converted into oil and guano by some of the numerous factories in the county, and the guano is shipped to places where it is manufactured into artificial fertilizers.

The number of people engaged in the river and shore fisheries is 70, the number engaged in the menhaden fisheries 243, and in the oyster fisheries 528. Of those given as being engaged in the oyster industries, very few pursue their work in the waters adjacent to the county. On the contrary, many of them go with their canoes and outfit to the Rappahannock and Potomac, and spend the winter there in oystering, returning in the spring to plant their small farms; for almost all of them combine the two occupations of farmer and fisherman.

165. NORTHAMPTON AND ACCOMAC COUNTIES.

The Eastern Shore of Virginia, comprising the counties of Northampton and Accomac, is a very low and fertile peninsula, about 55 miles long by 8 to 15 miles wide. It lies to the south of Maryland, with the ocean on the east and the Chesapeake on the west. Its population in 1880 was 33,197. Fully nine-tenths of the inhabitants are native-born on the peninsula. Onancock, a place of a few hundred inhabitants, is the largest town on the peninsula. The region is largely an agricultural one, and the people own small patches of land, and devote their attention largely to raising produce for the Northern markets, the principal crops being early potatoes, seed potatoes, and corn.

In addition to its agricultural interests, the region bears a peculiar relation to the salt water, and many of the inhabitants, having no interest in the land, are largely dependent upon the fisheries for a livelihood, while a considerable percentage of the farmers give more or less attention to fishing, oystering, and clamming at periods of the year when their crops do not require their attention. The peninsula, owing to its peculiar shape, has an extensive coast line, and its surface is so low and flat, that the tides and currents of the ocean have cut into it on either side, until we find no less than twelve creeks on the Eastern and seventeen on the Western Shore, each breaking up into a number of secondary ones, which communicate freely with each other, forming a complete net-work of tide channels, many of which are navigable for several miles by the small flat-bottomed vessels of the region. The tide channels extending through the northern and central portion communicate with a large bay on the south, thus forming a continuous inside passage for small boats from Cape Charles northward through Maryland to within a few miles of Cape Henry. The backbone of the peninsula is, therefore, a narrow ridge, only 3 to 5 miles wide, lying about midway between the ocean and the bay, and extending northward to the upper boundary of the State. Between this ridge and the ocean are a number of sandy or swampy islands, separated from the mainland at high tide by sheets of water of considerable extent. As the tide recedes large flats are exposed, and at low ebb the waters are reduced to mere creeks, bordered by immense grassy swamps. The Western Shore is somewhat different, for the higher lands occasionally extend to the Chesapeake, while the shores of some of the larger creeks are sufficiently elevated to admit of a scattered population. Such of the inhabitants as are engaged in farming occupy the arable lands formed by the central strip already mentioned, while others extensively engaged in fishing are usually scattered along the banks of the larger creeks or live in the vicinity of the bay shore. All,

however, are within easy reach of salt water, and the majority, even of the farmers, own small boats for catching a supply of fish for their own use.

The large flats and shoals in different parts of these two counties abound in oysters, clams, crabs, and terrapin, while the mouths of the creeks and the outer shoals are the feeding and spawning grounds of large numbers of fish, the supply being practicably inexhaustible. Were it not for the lack of a convenient market and the absence of suitable means of transportation, the fishing business would doubtless assume important proportions. As it is, the fisheries throughout the greater portion of the region are confined to supplying the local trade, and many of those who would follow the business regularly can fish only one or two days in the week, as they would overstock the market should they go out oftener. These, together with the farmers, often own small seines, and fish exclusively for several weeks in the fall, salting their catch for home use or for sale to people in the vicinity. In the neighborhood of the steamboat landings and about the southern end of the peninsula, where the fish can be sent to market by sailing vessels, the fishing is more extensive, and a considerable number of men follow the business regularly during the greater part of the summer; all of them, together with many of the farmers, engaging in the oyster fisheries as soon as the weather is sufficiently cold to warrant the shipment of their catch. These continue regularly in the work during the entire winter and well into the following spring, many of them deriving a large part of their income from this source.

The clam and terrapin fisheries, and such others as are not dependent upon a convenient market, have been quite extensively developed, and the fishing is prosecuted with considerable vigor, the catch being retained until such time as an opportunity presents itself for selling or shipping. About 2,300 dozen terrapins, valued at nearly $10,000, are taken annually, while over 8,000,000 of quahaugs, equal to 27,500 bushels, netting the fishermen $11,500, are shipped or eaten, in addition to over 1,000,000 clams purchased by parties at Capeville, to be canned and shipped to the Western States. Formerly the clamming interest was even more extensive than at present, and a considerable fleet of vessels came regularly to Hog and Cobb's Islands to purchase cargoes, which they carried to Philadelphia and New York. The vessels still visit the region, but the number is somewhat reduced, and many clams are carried in small boats to Franklin City, whence they are shipped by rail.

The fisheries proper of the region are chiefly confined to the bay shore, the fishing being most extensive about the mouths of the numerous creeks and near the southern extremity of the peninsula. Many of the fishermen use hand-lines, others seines, and within the last few years purse-nets and gill-nets have been very successfully employed. The hand-line fishermen catch sheepshead (*Diplodus probatocephalus*), trout (*Cynoscion maculatum*), spot (*Liostomus xanthurus*), mullet or merhead (*Menticirrus* sp.), and a few bluefish (*Pomatomus saltatrix*), all along the shores from May to November. The greater part of their catch is sold fresh in the vicinity of their homes, many of them fishing for a few hours in the early morning and spending the rest of the day in peddling their catch. At certain seasons they engage more extensively in the work, salting considerable quantities for winter use. There are about three hundred men engaged in the hand-line fishing for about five months in the year, with four hundred others who fish and clam occasionally during the same season. The total hand-line catch is valued at about $39,250.

Gill-nets were formerly much used in the spring shad fisheries of the eastern shore of Virginia, and they were also employed to a limited extent in the fall by the farmers for the capture of spot and other of the smaller species, to be salted for their own tables. Leaving out the shad fisheries, the business was of little importance until quite recently, when it became known that the better class of fishes, including Spanish mackerel (*Scomberomorus maculatus*), sheepshead, porgee (*Parephippus*

faber), bluefish or tailors, and trout could readily be taken in this way. Gill-nets were first introduced for the capture of mackerel about 1878, since which time they have been generally adopted in certain localities. At present they are extensively used between Hungar's Creek and the Maryland line from May until November, with the exception of about five or six weeks in midsummer. The men often go singly, though more frequently two fish together. The boats for this work are worth about $35 apiece, each being provided with three to five nets. The nets have a mesh measuring 3¼ inches, are about 25 fathoms long and 30 meshes deep, and cost from $5 to $7. They are set along the main shore and on both sides of Tangier Island, in from 6 to 14 feet of water. Formerly the fishing was prosecuted only at night, but within the last year it has been found that the mackerel will gill in the day time, and the Tangier fishermen often set their nets in the afternoon. There are about two hundred gill-net fishermen on the peninsula during five months of the year, and landing fish valued at $25,000, the greater part of which are shipped by steamer to Norfolk and Baltimore.

The first pound-net was introduced into the region by Messrs. Snediker & Warren in the spring of 1877. This apparatus was found to be peculiarly adapted to the eastern shore, and a large profit was derived from its use. Others soon engaged in the work, and there are now fourteen pounds between Hungar's Creek and Cape Charles, a distance of 15 or 20 miles. There are three others at Tangier Island, situated only a few miles below the northern boundary of the State. The pound-nets in the first-named region are necessarily very large and strong, on account of their exposed position. They cost about $1,000 each, and during an average season take about $4,200 worth of marketable fish, catching, in addition, about 500 barrels of menhaden and other non-edible species, which are usually thrown away. The principal species taken are mackerel, bluefish, and trout, though at times large catches of sheepshead and porgies are reported, and numerous other species are often taken in limited quantities. The seventeen pounds require the service of sixty-four men, who receive about $18 per month, the value of the catch for 1879 amounting to $57,000. The law forbids the use of pound-nets prior to the 25th of June, and requires that they be taken up by the 1st of October. The fishermen seriously object to this law, as it prevents their fishing in the early spring and in the fall, when the catch would be very large.

Haul-seines have been extensively used for many years, and prior to the war the greater part of the catch was taken in them. At that time shad were very abundant in the region, and large hauls were made during the spring and early summer. Of late, however, the shad visit the shores in much smaller numbers, and seine fishing has proportionately decreased. In the summer of 1879 there were only twelve seines, employing eighty-five men, fished along this shore. The value of the fish taken amounted to about $16,000.

One other industry promises to become quite important, namely, the menhaden fishery. The first oil and guano factory in Virginia was built near Cape Charles by Gallup & Kenniston in 1866 or 1867, but owing to its exposed location it was abandoned, and the business was for a time discontinued. A few years later the work was revived on the western shore of the bay, and in 1875 Capt. L. Crockett, of Tangier Island, built a factory for utilizing the menhaden that were peculiarly abundant in the vicinity. In 1878 another factory was built at the same place. In 1879 several other establishments were located along the shore, and in the spring of 1880 there were seven factories in the region, six of them using kettles for cooking the fish, while one was provided with the more modern steam apparatus.

C.—REVIEW OF THE OYSTER INDUSTRY.

By Richard H. Edmonds.

166. THE OYSTER INTERESTS OF VIRGINIA.

Dredging and tonging.—The waters of Virginia being in many places separated from those of Maryland by imaginary lines only, it is not to be expected that the conditions of the oyster trade and the class of people dependent upon it should show any very material difference in the two States. Different laws have of course exerted an influence upon some features of the trade, but the essential and most important fact in regard to the trade in both States is the same—that the oystermen are generally poor and illiterate, often intemperate and reckless.

Dredging on natural rocks was abolished in Virginia in 1879, and is only allowed at present on private beds; few, however, avail themselves of this privilege. In some parts of the State where planting is extensively conducted there are a few dredge-boats; but they meet with considerable opposition, as it is very generally believed by planters who do not dredge that the dredgers do not confine their operations to their own beds. This belief is probably correct. The beds are staked off with poles, sometimes 50 to 100 yards apart, and the dredgers sailing over one bed can scarcely, even if so disposed, keep from crossing the line which separates adjoining beds. The law entirely abolishing dredging on natural rocks was undoubtedly a mistake, since there are many localities in the State where, rightly restricted, it would prove very advantageous to the beds; while there are other places where the water is so deep that tonging cannot be carried on, and the beds are thus lying idle, of no value to the State or to any individual. The advantages as well as the disadvantages of dredging having been discussed in the report upon the oyster trade of Maryland, it is not necessary to refer to it here. The same course will be pursued with regard to other branches of the trade: it has not been thought necessary in the report on Virginia to repeat the discussion of subjects previously elaborated in the Maryland report.

The tonging interests of Virginia are far more extensive than the same interests in Maryland, and differ slightly in a few other respects, the most important of which is, that the proportion of negroes in the trade is greater in the former State than in the latter.

Previous to the late war the oystermen of Virginia were composed of negroes working for their masters, and of a very rough class of whites; but at the close of the war the demand for oysters was very great, and high prices were paid, and many who had been reduced from wealth to poverty were glad to avail themselves of the chance to make a support by oystering, which was at that time a very profitable employment. The four years of war, during which the oysters had almost a complete rest in many parts of the State, gave them a chance for development, and when the trade revived the beds were well stocked with large, finely-flavored oysters Men from nearly all occupations, representing all classes of society, eagerly entered the business, and soon there were hundreds of oystermen where formerly there had been but a dozen or so. Many of the most extensive farmers in the tide-water counties found that the conditions of labor had so greatly changed that to make a living it was necessary for them to devote all spare time to the oyster trade. This is still done to a considerable extent by those whose farms border on some salt-water creek or river, but the great bulk of the trade is in the hands of a rougher class, and in certain parts of the State it is almost monopolized by negroes. A very noticeable fact in connection with the tonging interests of Virginia and Maryland, and especially of the former State, is the almost

total absence of foreigners. Among the 8,860 tongers of Virginia there are, according to the statements of the county clerks, only about ten who are not Americans. These ten comprise an equal number of Germans and Irish. The entire trade may be said to be virtually in the hands of native Virginians, since there are probably not 300 tongers in the whole State who were not born and raised there. Such is not, however, the case in the other branches of the trade. As in Maryland, all oysters caught by tongers are sold to runners, and the majority of these are owned in other States and manned principally by Northern men. The life of an ordinary tonger presents few attractions to induce strangers to enter this business. The work is very laborious, the remuneration only fair, and the injury to health from exposure is so great that few ever reach old age. The death-rate among oystermen, as compared with other trades, is, from all that I can learn, very great.

As stated elsewhere, there are no records kept in Virginia of the number of boats engaged in the trade, and it was a very difficult matter to obtain any reliable information upon this subject. After traveling through the tide-water counties and gaining as near an estimate as possible, I then sent out a large number of circulars to the officials, and also to one or more prominent oystermen of each county, requesting their aid in the work, and desiring them to give me their estimates as to the number of canoes in their respective counties. Many of these gentlemen went to considerable trouble to work up the matter, and by their aid I was enabled to correct some of my own figures, and I am now able to present reliable figures, showing the number of canoes in each county engaged in the oyster trade and the number of men working on them. In addition to this I have succeeded in obtaining the number of schooners and sloops used for running oysters to market. It is difficult to divide these latter according to the counties in which they are owned, but I think the figures as given in the following table will be found very near correct. The number credited to Norfolk County appears somewhat large, but the figures are furnished officially by Mr. Rusha Denise, county clerk. The majority of these boats hailing from Norfolk County are owned in the cities of Norfolk and Portsmouth. Over three-fourths of them are quite small, being under 10 tons register, while there are very few of the other fourth that will register as high as 15 tons.

Table showing the number of canoes and larger vessels, and the number of men on each, by counties.

Counties.	Number of canoes and skiffs.	Men employed on canoes and skiffs.	Number of larger vessels.	Men employed on larger vessels.	Total number of men employed.
Accomac	545	925	282	1,176	2,101
Elizabeth City	170	510	40	160	670
Essex	150	400	6	24	424
Gloucester	410	530	28	112	642
Isle of Wight	58	250	22	88	338
Lancaster	400	900	35	140	1,040
Mathews	450	900	20	80	980
Middlesex	475	950	12	48	998
Nansemond	80	240	39	225	465
Norfolk	235	470	700	2,800	3,270
Northampton	350	700	38	144	844
Northumberland	281	420	27	108	528
Princess Anne	100	130	.....	.....	130
Richmond	200	400	20	80	480
Warwick	50	80	15	60	140
York	250	500	26	104	604
Westmoreland	275	550	5	20	570
King William	2	5	2	7	12
Total	4,481	8,860	1,317	5,376	14,236

Of the total number of tongmen there are 5,906 colored and 2,954 whites, while of those employed on the larger vessels only 1,792 are colored. The total number of each race engaged in the trade is, of whites, 6,538 and of colored 7,698.

Tonging in Virginia is probably equally as profitable as in Maryland, but there is more time wasted by the tongmen of the former State than by those of the latter. This is explained by the fact that the proportion of negroes is larger in Virginia than in Maryland, and these people are more generally inclined to be indolent than the whites. There were many cases last winter where tongmen made as high as $500 during the season, but their number is comparatively small when the total number of those engaged in this occupation is taken into account. A close estimate of the average amount made during a season by each tonger would give $200, or $25 less than the average amount made in Maryland. Calculating on this estimate, it will be seen that the earnings of the tongmen of Virginia will yearly aggregate about $1,772,000. Those employed on the running vessels receive during an oyster season of eight months $1,022,172, including their board.

The canoes used in Virginia are much smaller and less costly than those in Maryland—their average value being about $50. At this rate their total value at present is $224,050. The larger vessels, exclusive of those owned in Norfolk County, average about 16.13 tons; but when the large number owned in the latter county is considered, the average is considerably reduced and amounts to only about 10 tons—making the total 13,170 tons. The aggregate value of these vessels is about $790,200, and the amount of money annually expended in repairing them is in the neighborhood of $125,000.

A large part of the running trade in Virginia is conducted by boats owned in Maryland and in northern cities; but as the statistics of these have already appeared in the Maryland report, it is needless to repeat them here.

PACKING.—The packing trade of Virginia is of much later origin than that of Maryland. About the year 1859 a Captain Fitzgerald opened an oyster-packing establishment in Norfolk; but the war coming on, in a few years the business was greatly hampered and restricted, and it was not until 1865 that the trade gave any evidence of ever becoming very extensive. As the transportation facilities of the city increased, and the ill effects of the war began to die out, the oyster trade showed a very marked improvement, and during the last few years it has developed very rapidly. In Norfolk, as in Baltimore and other cities of Maryland, the trade is largely in the hands of northern men; one difference, however, being quite noticeable, and that is, that whereas in Maryland the packers are principally natives of Connecticut, in Norfolk they are nearly all either New York or Boston men. The enterprise and capital of these gentlemen has largely developed this business, which now forms one of the most important branches of Norfolk's trade. The increase in the packing trade of Norfolk has been instrumental in decreasing the shipments of oysters in shell by sail vessels from the bay to New York and Boston, as these two cities receive by means of the Old Dominion Line and the Merchants' and Miners' Transportation Company's lines the great bulk of Norfolk oysters. This important change in the course of trade has been very beneficial to Norfolk, as the shucking and handling of the oysters give employment to a large number of workmen. The trade of Norfolk has, however, been greatly restricted by the scarcity of oysters. During the early spring months of 1880 packers were unable to fill orders on account of the inability to obtain the oysters. During one of my visits to that city I found that for several weeks the entire receipts had been less than could easily have been used by any one of the large houses. Had it not been for this scarcity, which was felt to some extent during a large part of the season, it is quite probable that the packing trade would have consumed several hundred thousand bushels more of oysters. The trade of Norfolk is almost exclusively in raw oysters—there

having been only 3,000 gallons of steamed oysters packed during the entire season. Shipments are made in bulk, in barrels; and although, as previously stated, the largest part of the trade is with New York and Boston, there are considerable shipments to all points of the North and West.

Although Baltimore is pre-eminently the great packing center of the bay, it is nevertheless true that, considering the amount of capital invested in the business, Norfolk handles proportionately a much larger trade than the former city. The number of shuckers employed and their wages are in about the same proportion in the two cities. In Norfolk the buildings are generally very plain, often mere frame structures, while in Baltimore many of the packing houses are among the finest buildings devoted to trade in the city. The packing houses of Norfolk are not, as a general thing, used during summer for fruit-packing, as is the case in Baltimore. The number of oysters packed at Norfolk during the season of 1879–'80 was much larger than the combined totals of all packing points in Maryland, excluding Baltimore. The exact figures are as follows:

Place.	Raw oysters.
	Bushels.
Crisfield, Md	427, 270
Cambridge, Md	265, 410
Annapolis, Md	156, 703
Oxford, Md	108, 960
Saint Michael's, Md	37, 788
Sundry small places, Maryland	224, 817
Total	1, 160, 948
Norfolk, Va	1, 370, 855
Difference in favor of Norfolk	209, 907

Outside of Norfolk the packing of raw oysters in Virginia is very light. At several places a little business is done, but too small to be noted separately, since where there is only one packer in a town it would divulge his individual business to publish statistics of that town. At Hampton and at two places on the Rappahannock River quite an extensive trade in steamed or cove oysters is conducted. The word cove, as applied to oysters, has two entirely distinct meanings. When used by tongers it refers to large oysters caught in the small coves tributary to all creeks and rivers, while with packers and others it means oysters which have been steamed and hermetically sealed.

The following table shows the packing trade of Virginia for the season of 1879–'80:

	Norfolk.	Other places.	Total.
Number of firms	13	12	25
Capital invested	$96, 350	$23, 000	$119, 350
Estimated value of buildings and grounds occupied	$138, 500	$29, 000	$167, 500
Average number of hands employed	1, 027	501	1, 528
Wages of same	$154, 584	$46, 367	$200, 951
Number of bushels packed raw	1, 370, 855	58, 275	1, 429, 130
Value of same	$589, 127	$22, 020	$611, 147
Number of bushels steamed	3, 000	190, 000	193, 000
Value of same	$1, 500	$119, 400	$120, 900
Total number of bushels packed	1, 373, 855	248, 275	1, 622, 130
Value of same	$585, 273	$141, 420	$726, 693
Number of tin cans used	91, 000	620, 000	711, 000
Value of same	$3, 615	$18, 500	$22, 115
Number of wooden cases, barrels, &c., used	16, 871	1, 000	17, 871
Value of same	$11, 119	$1, 939	$13, 058

In Norfolk there are very few females employed in the oyster-packing houses, but of the 501 shuckers in other parts of the State 244 are females.

The number of people engaged exclusively in handling oysters for local consumption in the cities of Virginia is about 300 (nearly all colored), whose wages will aggregate about $57,600 a season. About 200 white men, with wages amounting to $83,200 a year, are employed in building and repairing oyster vessels, making cases, &c.

Summing up the foregoing statistics, we have the following tabular statement:

	Capital invested, real and personal.	Number of employés.	Wages and earnings of employés.	Estimated number of people dependent upon the trade, calculating 4 to each worker.
Packing	$286, 850	1, 528	$200, 951	
Tonging	224, 050	8, 860	1, 772, 000	
Running	790, 200	5, 376	1, 022, 172	
Local trade	10, 000	300	57, 600	
Building oyster vessels, &c	50, 000	200	83, 200	
Total	1, 361, 100	16, 264	3, 135, 923	65, 056

The shipments of oysters in shell from Virginia to Northern markets are still very large, although this trade is decreasing, as it is becoming more profitable to open the oysters at Norfolk and forward them by steamer. I endeavored to obtain the number of bushels carried north from May 31, 1879, to May 31, 1880, and I found that, while the number was very great, it by no means equaled the expectations of many large dealers. The fact is, as previously stated, many oystermen have a most exaggerated idea of the extent of the trade, believing it to be far greater than it really is. The following statistics have been compiled with great care, and will, I think, be found about correct:

Shipments of oysters in shell from Virginia for year ending May 31, 1880.

Destination.	For planting.	For immediate use.	Total.
New York			650, 000
Philadelphia and Delaware Bay	215, 820	223, 940	439, 760
Boston	5, 000	90, 000	95, 000
Providence and Providence River	180, 000	50, 000	230, 000
Fair Haven	133, 000	150, 000	283, 000
Portland, &c	9, 000	75, 000	84, 000
Washington		317, 317	317, 317
Maryland		1, 000, 000	1, 000, 000
By rail and steamers		216, 113	216, 113
Total			3, 315, 190

The number of bushels of oysters caught in the State during the year, and the disposition made of them, may be summarized as follows:

Packed in the State	1, 622, 130
Shipped out of the State in shell	3, 315, 190
Used for local consumption in the cities of the State	275, 000
Used for local consumption in the small towns and the counties of the State	1, 625, 000
Total	6, 837, 320

The average value of these oysters from first hands would be about 27 cents a bushel.

GENERAL SUMMARY.—The grand totals of the trade of the Chesapeake Bay are as follows:

Capital invested—	Maryland.	Virginia.	Total.
In packing	$3,928,376	$286,850	$4,215,226
In boats	2,042,500	1,014,250	3,056,750
In can-making, ship-building, &c	250,000	50,000	300,000
In local trade	25,000	10,000	35,000
Total	6,245,876	1,361,100	7,606,976
At Seaford, Del.:			
Invested in packing			43,100
Total for Chesapeake Bay			7,650,076

Number of bushels of oysters caught and the disposition made of them.

	Maryland.	Virginia.	Total.
Number caught	10,569,012	6,837,320	17,406,332
Packed	7,653,492	1,622,130	
Shipped in shell	2,021,840	3,315,190	
Local consumption	1,893,680	1,900,000	
Total	11,569,012	6,837,320	
Less number brought from Virginia	1,000,000		
Total	10,569,012	6,837,320	17,406,332

Number of people engaged in the trade and their earnings and wages.

	Number.			Earnings and wages.		
	Maryland.	Virginia.	Total.	Maryland.	Virginia.	Total.
Employés of packing houses	8,639	1,528	10,167	$777,779	$200,951	$978,730
On oyster boats	13,798	14,236	28,034	2,537,940	2,794,172	5,332,112
All others	1,990	500	2,490	504,802	140,800	645,602
Total	24,427	16,264	40,691	3,820,521	3,135,923	6,956,444

The total value of all oysters caught in the bay, as sold from first hands, is about $4,000,000. The product of the packing houses, which are, of course, classed as manufacturing industries, was valued at $4,610,995 for the year ending May 31, 1880.

PLANTING.—The natural beds of the Chesapeake Bay are so very extensive and productive that they have hitherto been able to stand the immense drain annually made upon them, and thus the necessity for cultivating oysters has never been forcibly impressed upon the oystermen of either Maryland or Virginia, although in the latter State this branch of the business is gradually attracting increased attention. In Maryland there are comparatively few planters. The time is rapidly coming when, to supply the constantly increasing demand, it will be absolutely necessary for the oystermen to engage in the cultivation of oysters. The beds are being depleted, and it is yearly becoming more difficult to obtain oysters enough to meet the wants of packers. Fine oysters especially are getting very scarce, and it is often impossible to obtain them at any price. One of the largest packers of Baltimore was compelled, during the winter of 1879–'80, to employ an agent in New York to purchase fine oysters for orders which could not be filled in the former city. About 1,000,000 oysters were bought by the agent and shipped from New York to the points from which the orders came.

The natural advantages for cultivating oysters afforded by the Chesapeake, with the innumerable creeks and rivulets tributary to it, are probably not surpassed in the world. The trade is but in its first stage of development. It can, and eventually will, be increased many fold. With proper attention paid to cultivation the bay may be made to furnish an inexhaustible supply of oysters. Where the trade now gives employment to one workman it should in the future give still more remunerative employment to at least a dozen. The capacity for increase is practically unlimited, and the demand is yearly increasing. The sooner the oystermen are forced, by the exhaustion of the natural beds, to engage in planting, the better it will be for all concerned, as the trade will then enter a healthier and more prosperous condition. There are many difficulties in the way, however, which should receive the most thorough scientific investigation.

The selection of the best planting-grounds, the causes of success or failure, the reason for the fact that sometimes for several consecutive years the oysters of an entire river may be very poor, and hence unsalable, and then suddenly, in one season, attain unusual excellence, are questions of absorbing interest, but little understood by the oystermen. The influence of salt or fresh water, according as the rainfall may be great or small, the tides and the winds, may all be studied with great pecuniary benefit to those concerned in the oyster trade. A statement made by one of the most experienced oystermen of Virginia, and confirmed by my own investigations, is to the effect that tongers rarely, if ever, accumulate money by their own labors unless they engage in planting. It is very true that planting is by no means always profitable. Its results are as uncertain as the cultivation of land, if not more so; but it is still, in the long run, far more profitable than tonging from natural rocks. It offers almost the only possible hope to the tonger of ever acquiring even a moderate competence. The work of Professor Brooks, of the Johns Hopkins University, in attempting the artificial propagation of oysters, has not yet progressed far enough to demonstrate the practicability of restocking the bay with an unlimited number of oysters by this means; but after all he has accomplished, it is safe to believe that he will continue the work until he has met with complete success. Planting will then prove still more profitable, as it will always be possible to obtain an abundance of oysters to be used as plants, which is not now the case. Chincoteague Bay, covering perhaps about the finest planting grounds in the world, has a very extensive business in this branch of the trade. The whole bay is staked off in small plats, which are always salable should the owner desire to retire from the business of planting. Oysters are bought in the Chesapeake Bay at prices ranging from ten to twenty cents per bushel, carried by vessels to Chincoteague and there planted, and allowed to remain undisturbed for two or three years. Sometimes they will remain very poor for several successive seasons, and at times it happens that the entire bed will be found on examination to be dead. The winter of 1879–'80 was the most profitable one that Chincoteague Bay has known for many years. The oysters were large, fat, and finely flavored, while for several preceding years they had been poor and almost entirely unsalable, and the trade in consequence had been very unprofitable. Chincoteague oysters are shipped almost exclusively to New York and Philadelphia, and during good seasons command high prices. From September 1, 1879, to May 15, 1880, the shipments from the bay amounted to 318,113 bushels, of which 166,113 bushels passed over the Worcester Railroad and 152,000 bushels were shipped in sail-vessels. Of those shipped over the Worcester road, 71,184 bushels were taken directly from the bay; while 94,929 bushels were taken from small creeks on the Maryland shore, where they had been transplanted and allowed to stay for a day for the purpose of fattening. It is a fact well known to oystermen that when an oyster is taken from salt water and placed in fresh, it will in two tides be bloated up very much; and thus, having the appearance of being fat, it commands a large price. If allowed to remain in fresh water longer than a day it soon becomes

sick and dies. This bloating process is often tried with very successful results, but has never proved to be as important as was supposed when it first became generally known. A few years ago it was tried by the packers of Baltimore, and, for a time, aroused great expectations; but at present it meets with little favor among them. A few of them have persisted in their efforts, but with indifferent success. To succeed well, the oyster must be taken from very salt water and placed in fresh. In the Chesapeake Bay the water is in many parts merely brackish, and it is supposed that on this account the oyster does not improve much upon a change to fresh water.

During the season of 1879–'80 Chincoteague oysters were in active demand at high prices, the average for the winter being not less than 60 cents per bushel, and in the latter part of May 90 cents was readily obtained. A feature of the Chincoteague trade is that all oysters are sold by the thousand, and not by the bushel, as in other parts of Maryland and Virginia. This custom has been adopted in conformity to the uses of Northern markets.

Capt. Barney Jones, probably the most experienced oysterman on the York River, and who for years has handled such quantities of oysters as to have acquired the title of "Oyster King," states that from his experience he is convinced that continued planting will in five or six years exhaust the fattening powers of oyster grounds, just as the fertility of any soil will be destroyed by attempting to produce the same crop for several consecutive years. This belief is said to be erroneous by Capt. Isaac M. Bussells, of Carter's Creek, Virginia, who has been engaged in the oyster trade, either in the North or on the Rappahannock River, since very early in life. He bases his statement upon the fact that in Connecticut there are certain oyster-grounds on which, during the past thirty years, oysters have never failed to fatten, and also upon his belief that oysters get their food from the water, and not from the ground. Captain Bussells has devoted considerable time to the study of oysters, and his convictions are the result of many years of experience in conducting a very heavy trade in all branches of the business.

It often occurs that oysters when caught will have green gills, and hence the name, now so common, of green-gill oysters. Up to a few years ago, I am informed, these oysters were unsalable, as by many persons they were considered poisonous. An oyster planter of Northampton County, Virginia, finding that for several years his oysters were green gills, determined to try to overcome the opposition to them. Whenever he or any of his workmen visited any city, they would go into different saloons and call for green-gill oysters, refusing to take any others. After a few visits to restaurants he succeeded in exciting some curiosity as to what was considered a very strange desire. He then explained that the popular belief was entirely wrong, and that green-gill oysters were perfectly safe, and were always fat, and stated that the green color was caused by a certain weed which is sometimes found at the bottom of the bay and its tributaries, and on which the oysters feed. In a short time no distinction was made against green-gill oysters, and in cities where known they are as much in demand as the ordinary oyster.

On the Rappahannock, the James, and the York Rivers planting is now being conducted quite extensively, although by no means on as large a scale as the advantages and likelihood of success would warrant. Fears are very generally expressed that in a few years the oyster-beds of these rivers will be exhausted if the present rate of shipments continues. That these fears are not groundless may be seen from the result of over-oystering in several of the creeks near the Rappahannock. From 1865 to 1871, during which time I was living in Virginia, the beds of Indian, Dividing, and Dymer's Creeks were well stocked with very fine oysters, the catching of which gave profitable employment to a large number of men. At the present time oysters are so scarce in these creeks that it is impossible to obtain even enough for planting. A few of the oystermen still eke out a poor living, but many have been compelled to give up the business entirely. The

laws of Virginia upon planting are so often changed that they tend to discourage this important industry. If an oysterman rents from the State a certain extent of planting ground, he is never sure that he will be able to keep possession of it, and, of course, should it pass out of his hands, he loses on account of having to sell his oysters before they fatten, or transfer them to some other ground. During the last session of the Virginia legislature it was proposed to sell all planting grounds belonging to the State; and so long as this subject remains unsettled it would certainly be unwise for oystermen to rent and plant on State grounds. The vacillating and changeable policy hitherto pursued by the legislature in its treatment of the oyster question, if continued, will certainly result in incalculable loss to the oyster interests of Virginia.

In planting oysters in Maryland and Virginia, the plants are merely thrown broadcast over the ground, and then allowed to take care of themselves. This system is so far different from the course pursued in Europe that, merely to show the contrast, I append an extract from a letter lately received from Mr. George Walker, United States consul-general at Paris, upon oyster culture at Arcachon, France:

"The oyster production takes place each year, from May 15 to July 15. During this interval each cultivator disposes upon the concession accorded to him—*i. e.*, upon what is called his *park*—a certain number of tiles, called *collectors*, plastered or covered with a mortar composed of sand and lime. These tiles are inclosed in wooden cages, so constructed as to prevent the access of fish, which, without this precaution, would cause great damage to the young oysters. Then begins the formation upon the submerged tiles of small brown spots, which slowly become transformed into the shell-fish. In the month of January of the following year the shells usually attain a diameter of from 1 to 3 centimeters.

"At this period the cultivators proceed to the operation of *détrocage* which consists in detaching the oysters from the tiles. This operation is rendered easy by reason of the plaster covering, which, by the way, prevents deterioration in the shells. The *détrocage* lasts generally until April. This operation terminated, the young oysters are disposed in square basins or pools, scooped out in the sand in the same *park*. These basins are called *claires*, and serve to keep the oysters under the water at low tide, to prevent them from drying. Here they remain until attaining a diameter of 5 to 7 centimeters, when they are ready for market. To reach this final stage they remain in the *claires* usually from sixteen to eighteen months. A portion of the Arcachon oysters are then sent to La Tremblade, near Marennes, where they are placed in special *claires* to become what are known as green oysters (*huitres vertes*). The remaining portion is sent directly to domestic markets or exported to England, which country absorbs at least 36,000,000 per annum."

From other sources I have learned that oyster farming in France is steadily on the increase, and that there are now 36,933 oyster-cultivating establishments, owned by 40,686 persons. Perhaps in future years the cultivation of oysters in the Chesapeake Bay will be conducted with the same care as in France, and then the trade will be of incalculable benefit to Maryland and Virginia.

The following letter from Mr. J. W. Hipkins, of Milton, oyster-inspector of Richmond County, Virginia, is of such an interesting character that I take the liberty of giving it in full:

"In front of this village there is a line of oyster rocks, in length about 2 miles, half mile in breadth, called Sycamore Drain Rocks, famous for hundreds of years for the superior quality of oysters, much esteemed for restaurant purposes in all the large markets. Fifteen years ago, to the boat of two hands, with ordinary oyster tongs, 20 tubs per day could be taken; at this time 4 tubs per day is about the average catch. These oysters are round, single, hard shell, and rarely poor. They command here from 60 cents to $1 per tub. If we could have a law enacted giving

a respite of four years to these rocks, they would be restored to their status of 1865. Probably the most destructive enemy to the young oyster, while the shell is comparatively soft, is the drum fish. They come up in large schools, and are also destructive to the soft-shell planted oysters of full size.

"There is a peculiarity attending the oyster in this section which has never been explained. (Can you give us an elucidation?) Probably once in a period of ten years the gills of the oysters are marked by a distinct green color, which remains with them nearly or quite a year. This change, I think, is general in this locality; yet I think the quality of the oyster is not in the least impaired by this discoloration. After heavy rains in the mountains, the water coming down from the Upper Rappahannock and Rapidan, being of a red color and thick, has a very bad effect on the oysters of the large rocks; it makes them sick, as the oystermen say, and they lose much of their muscular power, with their mouths open, constantly ejecting the offensive water. Many die after one of these heavy freshets."