

## STATISTICAL RECAPITULATION FOR PHILADELPHIA:

Number of planters, wholesale dealers, and shippers.....	75
Value of shore-property.....	\$100,000
Number of vessels and sail-boats engaged (registered in other States).....	250
Number of men hired by planters or dealers.....	250
Annual earnings of same.....	\$150,000
Number of restaurant servants, etc.....	3,500
Annual earnings of same.....	\$1,000,000
Total number of families supported.....	3,250
Annual sales of—	
I. Northern oysters.....bushels.....	1,740,000
Value of same.....	\$2,000,000
II. Chesapeake "plants".....bushels.....	940,000
Value of same.....	\$750,000
Total value of oysters sold annually.....	\$2,750,000

## O. MARYLAND AND BALTIMORE.

## 45. OYSTER-FISHERIES OF MARYLAND.

THE INVESTIGATIONS OF MR. R. H. EDMONDS.—In respect to Baltimore and Maryland, the information to be given is due almost entirely to the labors of Mr. R. H. Edmonds, of Baltimore, who investigated the subject in the capacity of special agent of the Census. His report for this special region was published in the *Journal of Commerce*, Baltimore, of which Mr. Edmonds was an editor during the summer of 1880, and gave much satisfaction to those who were interested in the matter in that city and down Chesapeake bay. If some of his expressions are too enthusiastic, they can easily be pardoned. The men of Chesapeake bay believe that their waters cover the very best oysters in the world, but my note-books contain a record of a dozen localities, all along the coast, where the same assertion is fondly made and sincerely believed. He is a wiser man than I, who attempts to decide among their claims and, *ex cathedra*, to award supremacy to any one district.

I shall have little to add to Mr. Edmonds' history of the oyster-interests of Maryland, and include all of his report in quotation marks:

GENERAL CONSIDERATIONS: INTRODUCTORY.—"The Chesapeake bay and its numerous salt-water tributaries, contain prolific and valuable oyster-beds, probably about equally divided between the two states of Maryland and Virginia. Notwithstanding the great importance and value of the oyster-trade of the Chesapeake bay, it is a subject upon which there has been no trustworthy information, either as regards its extent, the amount of capital invested, or the past and present condition of the business. The legislatures of Maryland and Virginia have, at every session for many years, revised and re-revised the laws upon this subject for their respective states; but have always been content to work in the dark, knowing nothing practically, and never seeing the value of obtaining full information upon so important an industry. There is, perhaps, no subject of such vital importance to either state, that is so little understood. By some it is as greatly overestimated as it is underestimated by others. Many who have never lived near the water, and who gain their information from the rose-colored pictures, drawn by correspondents who see only the best features of the trade, imagine that an oyster-bed is a mine of wealth, from which every oysterman may gather a liberal competence with but little labor. Nothing could be more erroneous.

"The present report must, at the best, be but the basis for a more elaborate and thorough scientific examination of this subject. From the chaos in which I found the business, so far as regards statistical information, I have tried to evolve some facts and figures which, by showing the importance of the trade, may cause a more careful study to be made of the means to arrest the present depletion of the beds, and provide ways for increasing the natural supply of oysters. Until this is done, it is almost useless to hope for wiser laws than those now in existence, many of which are not worth the paper upon which they are written. There are so many widely-differing interests, each seeking, through its representatives in the state legislatures, to have such laws enacted as will protect its own particular branch of the trade, regardless of what may be desired or needed by other branches, that it is utterly useless to expect to please all. Politicians, however, dependent upon the votes of the unlearned as well as the learned, must seek by all means to please their constituents, however unwise may be their desires. The carrying out of this doctrine results in a conflict of opinion among legislators, and no one being willing to relinquish his own pet theories, much time is wasted in useless discussions; and, at last, when a bill is proposed, it is subjected to so many amendments that, when finally passed, it would scarcely be recognized by its originator. In this way the laws both of Virginia and Maryland, bearing upon the oyster-trade, are often worse than useless; and, if by chance a law should be good, the means of enforcing it, and the penalties for violating it, will be so inadequate

that no good results will follow its passage. It is a lamentable fact, that a large part of the oystermen, many of whom are negroes, are so ignorant as to be easily led by demagogues. I have been informed by a prominent and reliable gentleman in Virginia, that during a late political canvass for the state legislature, one of the candidates, in an address to the oystermen, promised, upon condition of their voting for him, that, should they desire to break any of the oyster-laws, he, as a lawyer, would defend them free of cost. My own observation leads me to believe that this is by no means an exceptional case. I am inclined to think that just here lies one of the greatest hinderances to the enactment and enforcement of suitable laws.

"The oyster-trade of the Chesapeake bay is of vast extent, giving employment to thousands of workmen and millions of invested capital; and yet there are many intelligent men who believe that the blessings so lavishly bestowed by nature upon the tidewater counties of Maryland and Virginia, in the abundant supply of oysters and fish, are in reality productive of more harm than good. This belief is based upon the non-progressive character of the oystermen, who, as a class, are illiterate, indolent, and improvident. As the great natural productiveness of the soil in tropical countries has tended to retard man's improvement, by taking from him the necessity for constant labor, so has the abundant supply of oysters in the Chesapeake tended to make the oystermen unwilling to engage in any steady occupation. A tongman can, at any time, take his canoe or skiff and catch from the natural rocks a few bushels of oysters, for which there is always a market. Having made a dollar or two, he stops work until that is used up, often a large part of it being spent for strong drink. When his money is all gone he can repeat the same course. Unless spent in the indulgence of intemperate habits, a small amount of money will enable an oysterman to live in comparative comfort. He can readily, and at almost no expense, supply his table in winter with an abundance of oysters and ducks, geese and other game, while in summer, fish and crabs may be had simply for the catching. So long as they are able to live in this manner, it is almost impossible to get them to do any steady farm-work. This cannot, of course, be avoided, as they have a right to live in the manner which best suits their taste, although several laws have, at different times, been enacted, which, while not so expressed, were really intended to have the effect of making the tongmen, and especially the negroes, engage in other occupations. Could this be done without restricting the rights of citizenship, it would prove a great blessing to the negroes themselves, as it would lead them to regular work in the cultivation of land; and it is well known that as soon as these people are possessed of a house and a few acres of land, they become more law-abiding and industrious.

"It has generally been a favorite idea of the legislators, both of Maryland and Virginia, that each state should derive some revenue from the natural oyster-beds belonging to it. To this end many laws have been passed, but no satisfactory results have ever been accomplished. The expense of enforcing laws over such an extensive body of water as the Chesapeake bay, is necessarily very great. In 1879 the entire amount received from licenses to tong, to scrape, and to dredge in Maryland, was less than the cost of maintaining the oyster-police force. This, however, was an exceptional year, and very little was collected from dredgers, for reasons given elsewhere."

**THE MARYLAND OYSTER-POLICE.**—The oyster-police, to which Mr. Edmonds alludes, was organized in 1868, according to the law of the Maryland legislature at its session that year, which appropriated \$22,000 for its establishment. This money was to be expended in purchasing "a steamer and two tenders to be propelled by steam, sail, or oars, as the commissioners deemed best". The management of the force was intrusted to a committee composed of the governor, the treasurer, the comptroller, the superintendent of labor and agriculture, and the clerk of the court of appeals. The salary of the commander of the force was fixed at \$2,500 (now reduced to \$1,500) and his bond at \$20,000 (now reduced to \$10,000). The police-boats were required to be kept constantly cruising in search of violators of the oyster-laws, who, when caught, were taken before a magistrate for trial. The vessels of the force have been increased from time to time, till they now number one steamer and eight fast-sailing sloops and schooners. The sailing-vessels are assigned to certain parts of the bay, and are required to be constantly on the alert (except at night and Sunday) to prevent any violation of the laws by dredgers. The steamer is generally traveling as rapidly as possible, from one part of the bay to another, always trying to arrive in a locality before she is expected, thus hoping to catch illegal dredgers when they least expect it. This steamer, the *Leila*, Captain Travers, was generously placed at the service of Mr. Edmonds, by the fishery commissioners of the state, enabling him to obtain information of great value, which could not have been got at otherwise; and the thanks of Mr. Edmonds not only, but of the Census Bureau itself, are therefore due and gladly tendered to the commissioners.

All the boats of the police fleet are supplied with cannon and a large quantity of small-arms, and quite often there is need of the latter, as a fight with the dredgers will occasionally occur. Of late, however, these battles are becoming less frequent.

As appears elsewhere in this report, there has been dissatisfaction with the force ever since it was first organized, as it has never been possible to prevent illegal dredging; but the complaints largely come from those who know nothing of the difficulties encountered by the oyster-police. The number of dredging-boats is so great, and the territory over which the force must exercise supervision is so extensive, that it is impossible to arrest all who break the laws. The oyster-beds of Maryland "extend from Swan point, Kent county, opposite Baltimore, southward down to and up the Potomac—total distance, 125 miles; and east and west across the bay and Tangier sound, up all their tributaries as far as salt water reaches, in all depths of water—in fact, wherever there is salt

water in Maryland, we have oysters". This is the last official report in regard to the oyster-beds; since it was made, the beds have increased, and large quantities of oysters may now be caught in localities where a few years ago there were none.

Moreover, as will be exhibited subsequently in this report, the laws have never been in satisfactory shape for the operations of the force, and uncertainty, confusion, and positive hinderance in the carrying out of their obvious intention, has often arisen, through some misfortune in technical wording.

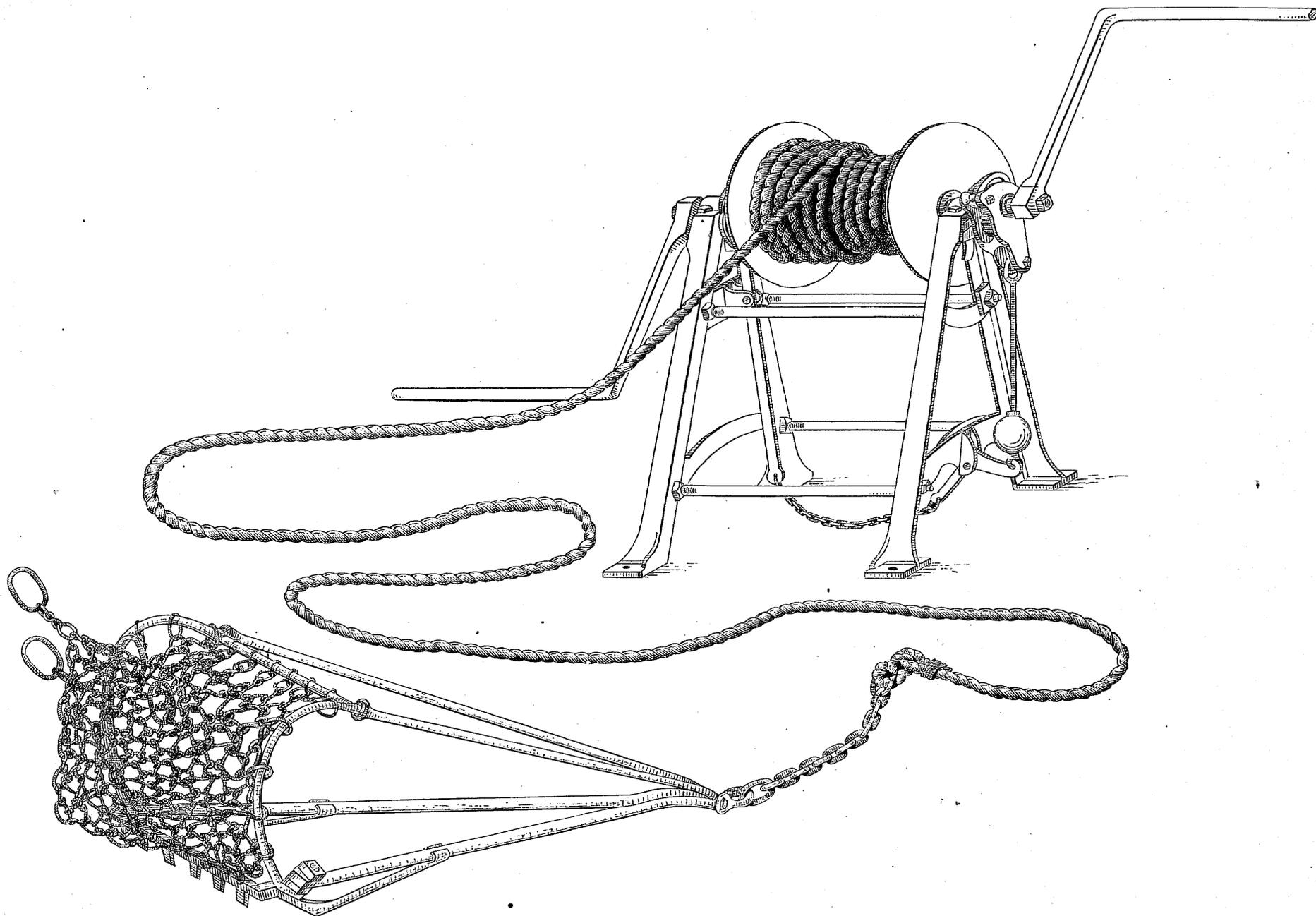
"Since the oyster-police force was first established," Mr. Edmonds continues, "up to September 30, 1879, the amount collected from dredging-licenses, measurers, and fines, exceeded the expenses of the force by \$235,156 59. In addition to this, there is a county tax upon tonging and scraping, which averages about \$10,000 a year. This amount is, by law, paid to the public schools of the respective counties. It would be necessary for the state to maintain the police force, even if it had to be done by appropriation from the general treasury. Disband the force, and in a few weeks the bay would be a battle ground for tongers and dredgers. This was plainly demonstrated last winter, on the Rappahannock river. Virginia having abolished dredging on natural rocks, it was decided to do away with the police force. In the winter of 1879-'80 about forty dredging-boats entered the Rappahannock and began work. The native tongmen, incensed at this depredation upon their beds, undertook to drive the dredgers away. In this, however, they signally failed. The dredgers, being well supplied with rifles, opened fire upon the tongmen. For several weeks the appearance of a tongman at any time, was certain to draw forth a volley from the dredgers. The legislature being in session at the time, it was decided to supply the tongmen with a cannon, a large number of rifles, and a supply of ammunition. Before the arrival of these, however, the dredgers had left. Such is but a sample of what would be constantly occurring, if the dredgers of Maryland were not overawed by the police.

"In Virginia there are some laws for taxing oysters, but as there are no means of enforcing them, they are worthless. The total amount of license-money received during 1879 was only a few hundred dollars. When gathering the statistics of the oyster-trade in Maryland, the matter seemed perplexing enough; but when the effort was made to obtain the same information in Virginia, the task was found to be even worse. State officials, from county clerks to auditor, knew nothing definite about the business. There was no license, as in Maryland; no record of the number of boats or men; in fact, nothing upon which to begin laying a foundation. The county officials, however, willingly rendered all the aid in their power, and to many of them I am greatly indebted for their kind assistance.

**DREDGING.**—"There are really but two ways of catching oysters practiced in this state: dredging and tonging. Scraping is but dredging on a smaller scale.

"Before discussing the merits and faults of our present method of dredging, it may be well to give some description of this manner of catching oysters, which, while very familiar to Marylanders, may not be so well understood by those who have never witnessed the practical working of it. Dredges are bags made of iron rings linked together, forming meshes similar to those of an ordinary seine, the mouth being held open by an iron frame, from the four corners of which project four iron bars converging to a point at a distance of a few feet from the mouth; to this point a short chain is attached, and joined to the chain is a long rope which winds around the windlass. Projecting downward from the bar, attached to the lower edge of the mouth, are iron teeth, which, as the dredge is drawn over the bottom, scrape up the oysters and guide them into the bag. Every vessel is supplied with two dredges and two windlasses, the latter being made stationary about midway of the deck on each side of the vessel. At the point where the windlass is screwed to the deck, a portion of the rail, three or four feet long, is removed, where, fastened to the side of the vessel, is an iron bar, over which the chain and rope run when the dredge is being worked, saving wear and tear. The windlasses are so arranged that each is worked by four men at the same time. When the boat reaches dredging-ground the captain takes the helm and the men prepare for their laborious task. The dredges are thrown overboard, and the vessel continues on her course until it is supposed that the dredge, which usually holds two or three bushels, is full, and then it is hauled up and its contents, consisting of oysters, stones, shells, crabs, fish, etc., emptied on deck. If the vessel has passed across the bar, she tacks and recrosses the ground, and continues sailing over the same bar for hours.

**CULLING AND LOADING.**—"If dredging is done in the day-time, the oysters are at once 'culled', but when working at night this is deferred until morning. 'Culling' consists in separating the oysters from the other things brought up by the dredge and throwing the latter overboard, while the former are placed in the hold of the vessel. In this manner the work continues until the vessel is loaded, when she at once proceeds to market. A trip will generally take about twelve or thirteen days. The effect upon an oyster-bar of dredging, has been thoroughly studied, both in this country and in Europe, and the conclusion almost invariably reached is, that it is beneficial to the beds when properly conducted as to time and manner; and my own investigations have satisfied me that this is correct. An oyster-bar, when left undisturbed for a number of years, has a tendency to solidify into an almost impenetrable rock. Dredging prevents this, and, by scattering the oysters over a wide area, greatly extends the bar.



CHESAPEAKE OYSTER-DREDGE WITH WINDLASS. [From specimen in U. S. National Museum.]

PROBABLE INJURIOUS EFFECTS OF DREDGING.—“But there is great danger that dredging may be carried to such an extent as to leave only an oyster here and there; and then the yield is too small to be profitable. Such is by some believed to be the present condition of a large part of the bay; and they hold that there is an abundance of oysters, although so widely scattered that it is very difficult to catch them. In a report upon the ‘oyster-beds of the Chesapeake bay’, made in 1872, by Mr. O. A. Brown, to the auditor of public accounts of Virginia, it is said that ‘the dredging of oysters is as necessary to their development and propagation, as plowing is to the growth of corn; the teeth of the dredge take hold of the rank growth of the oyster-beds, and, by being dragged through them, loosen them (which is done by hand in France in the management of their oyster-parks), and give them room to grow and mature properly; moreover, beds are continually increased in size, for when the vessel runs off the rock with the chain-bags filled with oysters, the oysters are dragged off on ground where no oysters existed, and thus the beds are extended, and when the vessel is wearing or tacking to get back on the oyster-beds, the catch just taken up is being culled off, the cullings thrown overboard to form new cultch for drifting spat to adhere to. Reliable oystermen tell me, that since dredging has been carried on in Tangier and Pocomoke, the beds have more than doubled in size, and, with the moderate force that worked upon them prior to the war, were continually improving. During the war the waters were thrown open to every one who would pay the military officials for a permit to oyster; the consequence was, that the oyster-beds were scraped bare, and it was two years before they could recuperate.’

“While dredging, properly conducted, is no doubt beneficial to the beds, I am inclined to think that it is being carried too far, and that its ultimate effect will be the same as in every European country where it has been unrestricted by proper laws. By some it is believed that the oyster-beds of the Chesapeake bay are of such vast extent, and the number of young annually spawned so great, that it will be impossible to destroy them. In view of the experience of Great Britain and France, and of the almost complete destruction of many of the once famous beds of the Chesapeake, such an opinion is without good foundation. The history of dredging in France and in Great Britain is very instructive, and may be studied with much profit by those who are interested in the preservation of the oyster-beds of the Chesapeake bay \* \* \*

PROSPECTIVE DESTRUCTION OF THE OYSTER-BEDS.—“As the best-stocked and most productive beds of Europe were quickly destroyed by unrestricted dredging, so may the hitherto seemingly exhaustless beds of the Chesapeake bay be depleted, if the present rate of dredging is continued. An illustration of this may be seen in the almost total exhaustion of the once famous beds of Tangier and Pocomoke sounds. Year after year these beds were dredged by hundreds of vessels, and even the summer-months afforded them but little rest. The result of this has been plainly seen during the past few years, and more especially during the season of 1879-’80, in the great scarcity of oysters in these sounds. Vessels having found it unprofitable to dredge in these sounds, since the oysters became so scarce, have turned their attention to other parts of the bay, and will thus give the beds a year or so of comparative rest. It is doubtful if they will ever again be as well stocked as in former years, for as soon as oysters again become plentiful, there will be a rush of all the dredging-boats in the state. Thirty years ago the depletion of these beds seemed almost impossible, and yet, at the present time, it is an admitted fact that oysters have decreased at least four-fifths in Pocomoke sound and two-thirds in Tangier. If it were possible to restrict dredging so as to give every bed an occasional year of rest, the result would prove the wisdom of such a course. Owing to the great extent of the oyster-beds in the bay, and their immense annual production, it may be some years before there is an oyster-famine, but sooner or later it is coming, unless there is a radical change in some of the present phases of the business. Properly protected and cared for, the ‘imbedded wealth’ of the Chesapeake might be increased many fold. It is a shame that the gifts so lavishly bestowed by nature upon Maryland and Virginia should receive so little practical appreciation.

LAWLESSNESS OF THE MARYLAND OYSTERMEN.—“Dredging in Maryland is simply a general scramble, carried on in 700 boats, manned by 5,600 daring and unscrupulous men, who regard neither the laws of God nor man. Some of the captains and a few of the men may be honest and upright, but it is an unfortunate fact, that such form a very small minority. The tenure by which the captains hold their positions is such, that they are almost forced to disregard the laws. Many of the boats are owned by unprincipled men, and I am informed that a number of them are even held by the keepers of houses of ill-repute. An honest captain, who complies with the law by not working on Sunday, at night, or on forbidden ground, will take at least a week longer to catch a load of oysters than one who, disregarding the laws, gets his oysters whenever or wherever he can. The first captain, upon his return, is informed in language more forcible than elegant, that unless he makes as quick trips as the second captain, his place will be filled by some one less scrupulous. With such a system as this carried out by a large number of the boat-owners, what but evasion of the laws can be expected of captains? When a premium is placed upon law-breaking, and a man is taught by his employers that oyster-laws are only made to be broken, and that the greater the skill displayed in evading them the greater will be his pay, it is scarcely to be expected that many will be able to resist the temptation. It is now rarely the case that a dredger can be found who will admit that he believes there is any wrong in disregarding the oyster-laws, and such a thing as being disgraced among his fellow-workmen by imprisonment for violating the laws, is totally unknown. In the above facts will be found

sufficient reasons why it has been impossible for the oyster-police, since its first organization, to enforce the laws. Seven hundred well-manned, fast-sailing boats, scattered over such a large space as the Chesapeake bay, are rather difficult to watch, and especially at night."

MORALS AND MANNERS OF OYSTERMEN.—Mr. Edmonds continues in his hard, but, I believe, entirely just, judgment upon his fellow-citizens, as follows:

"All blame for violating the laws does not, however, attach to the boat-owners, as some of them are prominent gentlemen of the most upright character. It is the misfortune of such men that their captains have often been trained by less honest employers, and having once acquired a love of ill-gotten gain, it is difficult to keep them from continuing in the same course. As he usually has a share in the profits, it is of course to his interest to make his trips as quickly as possible; and while the boat-owner may be opposed to breaking any laws, his captain may think and act otherwise.

"The unscrupulousness of the captain is well assisted by the character of his men. These men, taken as a class, form perhaps one of the most depraved bodies of workmen to be found in the country. They are gathered from jails, penitentiaries, work-houses, and the lowest and vilest dens of the city. They are principally whites, many of whom are foreigners (almost every European country being represented), unable to speak more than a few words of English. When a crew, which usually consists of about eight men, is wanted, the vessel-owner or captain applies to a shipping-agent, who then gathers these men wherever they may be found, drunk or sober. As one large boat-owner expressed it to me: 'We don't care where he gets them, whether they are drunk or sober, clothed or naked, just so they can be made to work at turning a windlass.' The shipping-agent having placed the crew aboard is then paid \$2 for each man furnished. With such a crew as this, who neither know nor care for laws, the captain is of course able to work wherever he desires to. As may be supposed, the life led by these men on board of the vessels is of the roughest kind. When sleeping, surrounded by vermin of all kinds; when working, poorly clad and with every garment stiff with ice, while the wind dashes the fast-freezing spray over them, hour after hour winding away at the windlass, pulling a heavy dredge, or else stooping with backs nearly broken, culling oysters. Returning from a trip, the men take their little pay and soon spend it in debauchery, amid the lowest grogeries and dens of infamy to be found in certain portions of Baltimore. It is a gratifying fact, though, that even amid such surroundings as these there are some few who are respectable and honorable men. This is more especially the case on the boats owned in the lower counties of Maryland. The crews of these are often gathered from the surrounding neighborhoods, and even as a class are not as degraded as those on Baltimore vessels.

PAY, "LAY," AND PROFIT.—"There are two ways in which these men are paid, the one most generally adopted, at present, being to pay them a stated amount per month, although payment is usually made at the end of each trip, the amount, of course, being proportioned to the length of the trip. The other plan is to allow the crew a share in the profits. When this is done, the vessel at the end of each trip first pays the 'grub bill', wharfage, and commission-merchant's charges; then, of the balance, one-third goes to the owner of the vessel, and a small bonus, usually about \$20, to the captain; after which captain and crew all share alike, except the cook, who receives something less than the others. When the first plan is adopted, the men receive their board and from \$10 to \$12, and occasionally as high as \$15, a month. Those working on shares will, during the season, average about the same as those who are paid a certain amount. A fair average of the amount made by each man would be \$11 a month, making \$77 for a season of seven months. Computing on this average, it will be seen that during an oyster-season the 4,900 dredgers receive about \$377,300, and the 700 captains, whose wages will average \$50 a month, about \$245,000, making a total of \$622,300. It would also be proper to add to this amount the cost of boarding these men, since that in fact forms a part of their wages. This costs the vessels about \$7 50 a month for each man; equal to \$420 a season for each boat, or \$294,000 for the entire fleet. This, added to \$622,300, gives a total of \$916,300 paid to the dredgers of Maryland during every oyster-season.

LICENSES TO DREDGE.—"The law requires all boats engaged in dredging to obtain from the state comptroller a yearly license, costing \$3 for each registered ton."

The blank form of this license reads as follows:

No. —.

*License to dredge for oysters.*

STATE OF MARYLAND, TREASURY DEPARTMENT,  
Comptroller's Office, Annapolis, —, 187 .

License is hereby granted to —, of —, owner of a — named —, the tonnage of which, according to its custom-house license (or "as sworn to"), is — tons, and the master of which —, of —, to use said — in taking and catching oysters with scoop, scrape, drag, dredge, or any similar instrument, within the waters of the Chesapeake bay, from the 1st day of October, 187—, until the 1st day of May next, in accordance with the provisions of an act of the general assembly of Maryland, passed January session, 1874, chapter 181, entitled "An act to repeal article seventy-one of the code of public general laws, entitled 'Oysters', as amended and re-enacted by chapter three hundred and sixty-four of the acts passed at January session, eighteen hundred and seventy, and also chapter one hundred and sixty-seven of the acts passed at the January session, eighteen hundred and seventy-two", he having paid for this license the sum of — dollars.

This license shall hold good for one year, and authorizes said vessel to be used in catching oysters with scoop, scrape, drag, dredge, or any similar instrument, within the waters of the Chesapeake bay and in Eastern bay, outside of a line drawn from the southwest

corner of Second Kent point to Wade's point, but not on any oyster-bar within one and a half miles of Talley's point, Sandy point, Hackett's point, Thomas' point, Holland's Island bar, Three Sisters, Swan Point bar, Poplar island, one-quarter of a mile west of and between the island and the main land, nor within half a mile of Plum point, and authorizes the said parties to buy and sell oysters in this state, and does not authorize any steamboat, steam-vessel, or steam-machinery to be used for the purpose of catching oysters.

In testimony whereof I hereunto subscribe my name, and affix hereto the seal of the comptroller's office.

Comptroller.

STATISTICS OF OYSTER-LICENSES, 1870-'80.—“For reasons explained elsewhere,” continues Mr. Edmonds, “this law has never been fully enforced, and the records of the past season are entirely without value in determining, even to an approximate degree, the number of dredging-boats, since more than one-half of them worked without license. Through the kindness of the Hon. Thomas J. Keating, state comptroller, I have obtained the record of the past ten years, as shown in the following table:

*A statement showing the number of boats licensed to dredge, their aggregate tonnage, and the amount of license-money paid during the past ten years, compiled from the books of the comptroller's office at Annapolis.*

Counties.	Number of boats.	Aggregate tonnage of same.	Amount of license paid by same.
1870-'71	637	13,862.49	\$41,587 46
1871-'72	597	13,013.21	39,039 02
1872-'73	559	17,604.23	52,312 09
1873-'74	621	10,075.91	30,227 73
1874-'75	583	14,118.53	42,355 58
1875-'76	691	16,156.23	48,468 68
1876-'77	677	16,612.48	49,837 46
1877-'78	565	14,469.46	37,408 39
1878-'79	465	10,391.10	31,173 29
1879-'80	327	6,202.17	18,606 50
Total			391,517 40

NUMBER OF VESSELS IN THE FLEET: UNLICENSED VESSELS.—“It will be seen by examining the above table, that the highest number of licenses issued in any one year was in 1875-'76, when there were 691 boats, having an aggregate tonnage of 16,156.23, or an average tonnage of 23.38 each. Since that year there has been a steady decrease in the number of licensed dredgers, although there has been no decrease in the actual number of boats engaged in the business. Knowing this to be true, and also mindful of the fact, that even in 1875-'76, there were some unlicensed dredgers, I have thought it safe to place the number of dredging-boats working during the season of 1879-'80 at 700. There are some well-informed persons who would make the figure as high as 800, but I have based my statement upon information gathered from many sources. Taking the average tonnage in 1875-'76, and multiplying it by 700, we have 16,366 as the aggregate tonnage of the vessels now engaged in dredging. At \$3 per ton for license, this should have yielded the state, during the past season (1879-'80), a revenue of \$49,098 instead of \$18,606 50, the amount collected. The 327 vessels which, either from honesty or policy, paid into the state treasury \$18,606 50, received no privileges or advantages not taken by the 373 which dredged without license.

OYSTER DREDGING-BOATS.—“Dredging-boats range in size from 5 to 75 tons, and in value from \$500 or \$600 to \$8,000, some few owned in the lower part of the state being valued as high as \$10,000. The boats owned in Baltimore are, generally, in every way inferior to those hailing from the counties. The present value of these boats, basing the estimate upon information obtained from all parts of the state, would be an average of not less than \$1,500, and is believed by many to be much higher. At this rate, however, the 700 boats in the trade would be worth, to-day, \$1,050,000. In addition to this, the winders, dredgers, roller and chains, and dredge-lines on each boat may be valued at \$100, although costing considerably more. Adding this to the value of the boats, we have \$1,120,000 as the amount of capital invested in the dredging-boats. The total tonnage of the dredging-boats being 16,366, and the estimated value of the same being \$1,050,000, the average value will be \$64 15 per ton. As some tonnage has lately changed hands in Baltimore at \$67, the above estimate can scarcely be too great, when the high class of many of the boats is considered.

“The amount annually expended for repairing these vessels is about \$105,000.

SCRAPING AND TONGING.—“Scraping, which is simply dredging on a smaller scale, both as to the size of the boat and the dredge, is conducted only in shallow water; and while dredge-licenses are issued by the state, scraping-licenses are obtained from the counties, and hold good only in the local waters of the county in which issued. Dorchester, Talbot, and Somerset are the only counties in which scraping-licenses are issued. In the first two the charge is regulated by the tonnage of the vessel (being \$2 per ton), while in the last there is a uniform charge of \$10 on each boat, regardless of size. The crews of these vessels average about four men each, the majority of whom are able to return home after each day's work, as the boat does not go out of the county waters, except to make an occasional run to a neighboring market.

LICENSES OF SCRAPING-BOATS.—“The number of scraping-boats licensed during the past seven years is as follows:

Counties.	1873-1874.	1874-1875.	1875-1876.	1876-1877.	1877-1878.	1878-1879.	1879-1880.	No. of men employed on same during 1879-'80.
Dorchester .....	106	149	180	142	142	157	134	536
Talbot* .....		59	40	47	27	34	29	116
Somerset .....	224	322	209	165	50	151	57	228
Total .....	330	530	429	354	228	342	220	880

\* No scraping law until 1874-'75.

SIZE OF SCRAPING-FLEET: CHARACTER OF BOATS.—“The above figures have been kindly furnished to me by the clerks of the respective counties, and, while they embrace all vessels that are licensed, they by no means include all that are scraping. From personal inspection and from reports of reliable persons, I feel safe in placing the number of scraping-boats at 550, carrying 2,200 men. The additional 330 boats are working without license. The pay of these men will average about \$18 a month each, for the seven and a half months employed, amounting to \$135 for the season, and making a total of \$297,000 received by the 2,200 men, including the captains, whose pay is of course larger than that of the men.

“The average value of scraping-boats, including their outfit, is \$800, which gives a total of \$440,000 invested in scraping. About \$27,500 is annually expended in repairing these boats.

CHARACTER AND PROFITS OF OYSTERING: SCRAPERS AND TONGERS.—“Socially and morally the scrapers are somewhat superior to the dredgers. Tonging, although employing less capital and fewer men than dredging, is probably of greater value to the state than the latter, because the men engaged in it are of a better class, are better remunerated for their labor, and are less prone to evade the laws than the dredgers. While this much may be said in the tongmen's favor, it is yet an unpleasant truth that they, like all others engaged in the oyster-trade, either as catchers or shuckers, are, as a class, indolent and improvident. The majority of them live near the water, often owning a small house and an acre or so of land (the value of which depends upon the proximity of good oyster- and fishing-grounds), and a canoe or an interest in one, used in winter for oystering and in summer for fishing. Having secured a house, their ambition seems to be satisfied, and but little time or money is spent in beautifying or improving it. It is too often the case that tongers, especially many of the negroes, who comprise about one-third of the total number, will work only one or two days at a time, and then remain idle until necessity forces them again to earn a few dollars.

“By others, however, tonging is pursued as steadily and systematically as the wind and waves will allow, and when this is done I think it may safely be said, that the remuneration is equally as fair as in other trades. Those who pursue tonging in this way, form the most intelligent class of oystermen in the state. In some cases farmers and others, holding prominent social positions, may be found oystering during several of the winter months, when their legitimate business does not require close attention. Tonging necessitates very great exposure to the cold, but is, however, hardly as severe in this respect as dredging, and moreover the tongers suffer less, from the fact that they are generally better clad than the dredgers, and seldom work either during very cold or very windy weather, on account of the smallness of their boats. From this cause I find that even the industrious ones will lose, on an average, at least two days out of every week, and when the time wasted by the idle ones is taken into account, it will be found that 120 days out of an oyster-season of eight months is about the average length of time for each tonger. In this actual loss of at least one-half of their time, may be seen the cause which prevents the tongers, as a class, from making any improvement in their financial condition, and upon their financial condition depends their social position.

“While seeking information from the county clerks as regards the number of boats licensed, I also requested answers to the following questions, with a view to obtaining home-opinion upon the character of the tongers:

“No. 1. What is the moral and social condition of your oystermen? No. 2. What is their occupation during the summer-months?

“In answer I received the following from Somerset county: No. 1. The oystermen, as a class, are generally poor men, residing near the water-courses, living in and mostly owning small houses, with an acre or so of land or less attached to their premises, and in morals are equal to any body of men similarly situated. No. 2. In the summer, oystermen work on their lots, and do some job work for their wealthier neighbors, but it is still to be feared that much of their time is unemployed. From Worcester county: No. 1. Of a rather low order; some of them good as to morals, but a large majority reckless and improvident. No. 2. Chiefly as day-laborers; others cultivate small parcels of land. From Dorchester county: No. 1. As a class, only fair. No. 2. Most of them have small truck-farms to cultivate. From Saint Mary's county: No. 1. Fair. No. 2. Fishing and agriculture principally. From Anne Arundel: No. 1. Unable to answer the question, but believe they compare favorably with other industrial classes. No. 2. Crabbing and bedding oysters.

VESSELS ENGAGED IN TONGING.—“Tonging, although generally confined to shallow water, is in some of the tributaries of the bay carried on in water varying in depth from 18 to 20 feet.

“Engaged in tonging there are 5,148 men, using 1,825 canoes or other small boats. To obtain even an approximate average of the amount of money made by each tonger is almost impossible, but I think it will be very near correct to estimate it at \$225 a season, at which rate the total amount made by the tongers would be \$1,158,300. There being 1,825 boats and 5,148 men, the average number of men carried by each boat is a little less than three. Many of the larger boats are held in joint ownership by two or three parties.

STATISTICS OF TONGING-LICENSES, 1870-'80.—“A statement is available and furnished herewith of the number of tonging-licenses issued during the past ten years, and the number of men employed on the boats in the season of 1879-'80.

Counties.	1870-1871.	1871-1872.	1872-1873.	1873-1874.	1874-1875.	1875-1876.	1876-1877.	1877-1878.	1878-1879.	1879-1880.	No. of men em- ployed on boats 1879-'80.	Figures furnished by—
Anne Arundel .....	307	240	300	421	314	396	250	348	343	301	903	Spriigg Harwood.
Calvert .....	145	146	324	380	237	207	186	198	243	312	624	S. Sellers.
Charles .....	8	12	48	22	50	40	28	23	30	41	123	B. G. Stonestreet.
Dorchester .....	331	441	575	405	472	280	212	182	142	190	507	Chas. Lake.
Kent* .....					120	101	101	106	122	123	369	Samuel Beck.
Queen Anne's .....	118	119	178	183	210	172	146	139	144	145	435	James Wooters.
Somerset .....	179	252	245	125	329	239	72	59	2			Benj. F. Lankford.
St. Mary's .....	267	220	362	307	325	272	244	107	212	183	549	J. Frank Ford.
Talbot .....	199	184	274	280	294	276	254	217	258	281	843	J. Frank Turner.
Wicomico .....	112	106	195	125	172	98	88	133	108	134	492	S. P. Toadvine.
Worcester† .....					291	241	193	170	211	106	213	I. T. Matthews.
Total .....	1,666	1,720	2,501	2,248	2,814	2,331	1,774	1,772	1,815	1,825	5,148	

\* No records farther back than 1874. † No license required until 1874-'75.

“The information contained in the above table was kindly furnished to me by the gentlemen named, who are the clerks of the circuit courts of the respective counties, and from whom all licenses to tong must be obtained.

LAWS FOR THE REGULATION OF TONGING.—“The law in relation thereto is, ‘that any resident of this state desiring to use any canoe or other boat in catching or taking oysters for sale, with rakes or tongs, in any of the waters of this state, shall first obtain, by application to the clerk of the circuit court for the county wherein he may reside, a license therefor, and such license shall have effect from the first day of June in the year in which it may have been obtained, to the first day of June next succeeding; provided that such license shall not authorize the use of said canoe or boat in taking or catching oysters in any creek, cove, river, inlet, bay, or sound within the limits of any county other than that wherein the license shall have been granted, and that the boundaries of counties bordering on navigable waters shall be strictly construed, so as not to permit the residents of either county to take or catch oysters beyond the middle of the dividing channel; \* \* \* and every applicant for such license shall pay to the clerk of the court where such license may be granted, and before the issuing and delivery of the same, according to the following rates, viz: for any boat measuring in length 20 feet or less, the sum of \$2; measuring from 20 to 25 feet, the sum of \$3; measuring from 25 to 30 feet, the sum of \$4; and all over 30 feet, including sloops under custom-house tonnage, the sum of \$5 each; and all oysters taken with rakes or tongs shall be culled upon the natural beds where they are taken; the amount received from tonging-license to be paid by the clerk to the school commissioner's for the public schools of the respective counties where such license is issued; provided the sum received from white tongers shall go to white schools, and the sum from colored tongers to colored schools.’

LICENSES AND THEIR VALUE TO THE STATE.—“The money arising from licenses issued to tong and to scrape during the year 1879, amounted to \$8,959 89, which was turned over to the boards of school commissioners of the various counties, with the exception of \$210 received by Worcester county for licenses, and which was used by the county commissioners in purchasing ‘plants’ to be bedded in the county waters. It may be well to explain, that the laws in Worcester county are different from those in the other counties, in respect to the disposal of license-money, and also as regards the issuing of license. In this county the license is \$1 on each man in the trade, and no account is taken of the boat.

“Since 1874-'75, the number of licenses granted has decreased from 2,814 to 1,825 in 1879-'80. There are several causes for this, the principal one probably being the unprofitableness of tonging, for several seasons past, as compared with former years. From 1865 or 1866 to 1874 or 1875, tonging was quite profitable, as oysters commanded a good price, but since the latter year prices have ruled very low, and many have turned their attention to other occupations. It may be that some few tongers are working without license, but from the testimony of those

well posted in the business, I am led to believe that the number is comparatively small. Mr. Benjamin F. Lankford, clerk of the circuit court of Somerset county, makes the following statement in regard to scraping-boats, which is equally applicable to tongers: 'The oyster-business has been gradually declining in this county since 1873; during that year the number of dredge [scraping] licenses issued was 327, and the money received therefor was \$3,270, which sum was paid into the public school treasury. I do not think, however, that the great difference exhibited between the years 1874 and 1879 shows the actual amount of the decline in the business. The present oyster-law is inefficient or is inefficiently executed.' By referring to the table showing the number of tonging-licenses issued during the past ten years, it will be seen that in Mr. Lankford's county—Somerset—there were 329 in 1874-'75, while in 1879-'80 there was not a single license issued to tong. The size of the tonging-canoe ranges from 15 or 16 feet to 30 feet or more, the larger ones being called 'bugeyes.' Owing to this diversity in size, it is very difficult to estimate the value of these boats, but a fair average is about \$100, which would cover the entire outfit—making \$182,500 the amount invested in tonging-boats.

**CARRYING TRADE: "RUNNERS".**—"Closely connected with tonging, and each mutually dependent upon the other, is another branch of the trade conducted by vessels, generally known as runners, of which there are owned in this state 200, carrying about 800 men. The oysters caught by tongers are either sold to these vessels, and by them carried to some market in the state, or they are bought by boats owned in other states and carried to northern cities. The runner will anchor near some tonging-ground, and an empty basket or a small flag will be hoisted to the masthead as a signal that she is ready to receive oysters. In one or two days she will be loaded, and is at once off for a market. On some occasions half a dozen or more runners may be seen in the same locality, surrounded by forty or fifty canoes. As soon as a tonger has caught as many as his small boat will carry, he sells out to the runner and returns to work.

**CREWS OF RUNNERS AND THEIR PROFITS.**—"The men employed on runners will average about \$18 a month, including their board, which, with the pay of the captains (which is about \$50 a month), will amount to \$166,400 for a season of eight months, that being the length of time that these vessels are engaged in carrying oysters. Reckoning the average value of the runners at \$1,500, will give a total of \$300,000 in this branch of the trade. About \$30,000 is annually spent in repairing the 200 runners.

**EXTENT OF THE MARYLAND OYSTER-FLEET.**—"Summarizing the foregoing statistics as to the number of vessels, their value, etc., it is seen that there are:

Boats.	Number.	Crews.	Annual wages.
Dredging .....	700	5,600	\$916,000
Scraping .....	550	2,200	297,000
Canoes .....	1,825	5,148	1,158,300
Runners .....	200	800	166,400
Total .....	3,275	13,748	2,538,000

**WAGES AND PROFITS.**—"The totals of this table furnish an average of \$184 60 for each man. It is utterly impossible to obtain the number of people supported by this \$2,538,000. Perhaps not one-half of the dredgers support any family; but with tongers and scrapers it is different. Five is usually reckoned as the average number of a family; but as very many of these men are single, it would be too high in the present case. It can scarcely, however, be too much to reckon that for every oysterman there is an average of four individuals dependent upon him. This would give 54,992 as the number of people supported by the catching of oysters in this state. In addition to this, there are hundreds dependent indirectly, as shopkeepers and in other ways, upon the oystermen.

**MARYLAND CAPITAL INVESTED IN OYSTER-FISHING.**—"Invested in oyster-boats, the summary is:

700 dredgers, at \$1,500 .....	\$1,050,000
Outfit of same .....	70,000
550 scrapers, at \$800 .....	440,000
200 runners, at \$1,500 .....	300,000
1,825 canoes, at \$100 .....	182,500
Total ..3,275 .....	2,042,500

"The amount annually expended for repairs for these vessels is, as near as I can calculate, from reports received from shipbuilders, \$162,500, of which probably \$75,000 is received by carpenters, sailmakers, and other workmen."

**MR. MALTBY'S ESTIMATE OF THE YIELD OF CHESAPEAKE BAY, IN 1865.**—Before following Mr. Edmonds into a new branch of the business—that of shipments in shell—it may be well to give briefly some memoranda by Mr.

C. S. Maltby, of estimates upon the former yield of Chesapeake bay. The first of these is a table of oysters taken in Maryland waters alone in 1865, which is as follows :

*Oysters taken in Maryland waters, 1865.*

Destination.	Dredged.	Tonged.	Total bushels.
Baltimore .....	2, 750, 250	144, 750	2, 895, 000
Washington and Alexandria .....	178, 125	9, 375	187, 500
Boston .....	210, 000	105, 000	315, 000
Fair Haven, Connecticut .....	131, 250	393, 750	525, 000
New York .....		202, 000	202, 000
Philadelphia .....	360, 000		360, 000
Seaford, Delaware .....	27, 500	247, 500	275, 000
Salisbury, Maryland .....	6, 000	54, 000	60, 000
Total .....	3, 663, 125	1, 216, 375	4, 889, 500

Second, is given the following table of—

*Oysters taken in Virginia waters, 1865.*

Destination.	Dredged.	Tonged.	Bushels.
Baltimore .....	916, 750	48, 250	965, 000
Washington and Alexandria .....	59, 375	3, 125	62, 500
Boston .....	23, 334	11, 666	35, 000
Fair Haven, Connecticut .....	43, 750	131, 250	175, 000
New York .....		787, 500	787, 500
Philadelphia .....	40, 000		40, 000
Total .....	1, 083, 209	981, 701	2, 065, 000

The consumption of Baltimore that year was: by city and county trade, 625,000 bushels; by raw-packing, 1,875,000 bushels; by "preserved", 965,000 bushels; total, 3,465,000 bushels.

EXTENT OF THE CHESAPEAKE OYSTER-FLEET OF 1865.—The gathering of oysters in the Chesapeake in 1865, according to the same notes, employed 1,000 boats in dredging. These would average 50 tons in size, and were said to yield \$200,000 in tax, at \$4 per ton. The average dredgings of these boats are given at 4,746 bushels, which, at 45 cents, yielded \$2,135 70. In tonging that year there were said to be engaged 1,555 canoes, distributed as follows :

*Canoes tonging.*

On Nanticoko river .....	200	On Chester, including Swan Point .....	135
On Fishing bay .....	150	On Annapolis .....	50
On Wicomico river .....	125	On South and West rivers .....	50
On Little Annemessex .....	40	On Herring .....	40
On Manokin .....	50	On Patuxent .....	200
On Pocomac and tributaries .....	300	On mouth of Potomac and Saint Mary's .....	75
On Miles river .....	50		
On Choptank and Sharp's islands .....	100	Total .....	1, 555

Each of these canoes should pay \$44 a year tax. This, theoretically, yielded the state in 1865, \$63,420.

46. PACKING AND SHIPPING TRADE OF MARYLAND.

SHIPMENTS OF OYSTERS IN SHELL.—I now resume the language of Mr. Edmonds' report :

"From the prolific beds of the Chesapeake bay immense quantities of oysters are yearly taken for bedding in northern waters, and also for immediate consumption in the principal cities along the coast, from the bay to Portland, Maine. It is not the West alone which is dependent upon the Chesapeake for oysters, for without the supplies annually drawn from this bay the Atlantic coast, from Delaware to Maine, would be but poorly supplied. The Chesapeake is the great storehouse from which several millions of bushels of oysters are annually carried to restock the exhausted beds of other localities. More than two hundred vessels, averaging in value about \$3,000 each, are for eight months of the year engaged in the trade between the bay and northern markets. During the winter the oysters which are taken north are used for immediate local consumption, while those taken in the spring are used almost exclusively for bedding purposes. At Seaford, Delaware, there is quite an extensive packing-trade, Maryland oysters being used. It is well known that oysters are eaten during the summer at the North much more extensively than in Maryland and Virginia.

"Among many intelligent men, both in Maryland and Virginia, there is great opposition to the shipment of oysters in the shell to northern markets. They claim, and justly too, that the packing trade of the two states

would be much more largely developed if northern cities were unable to buy oysters in the shell, and as the shucking of oysters gives employment to such a number of people, they hold that it would be a wise policy to heavily tax all oysters shipped in the shell. It is very questionable, however, whether such a measure would be constitutional.

"Two great objections which might also be urged against the system, are that the majority of oysters shipped north are purchased late in the spring, when the packing trade is about over, at prices necessarily low, and that the beds are seriously injured by being disturbed after the commencement of the spawning season. The oysters purchased and taken north in the spring for bedding would, if allowed to remain until the fall and then sold for immediate use, bring nearly half a million dollars more than they now sell for; that is, there would be a yearly gain to the oystermen of Maryland and Virginia of nearly half a million dollars.

"There being in the spring no home demand for them, they sell sometimes as low as 4 cents a bushel, and from that up to 12 and 15. In the spring of 1879 a vessel loaded in the Great Choptank river with 16,000 bushels, cost \$340, or just 4 cents a bushel. These oysters are taken north and planted, where they grow very rapidly, and during the following fall and winter they come in competition with oysters from Maryland and Virginia packers.

STATISTICS OF SHIPMENTS FOR NORTHERN PLANTING IN 1879.—"During the spring of 1879, Capt. Samuel M. Travers, of the oyster-police force, directed his deputy commanders to board all vessels loading with plants for northern waters, and obtain the number of bushels taken. He has favored me with the result, which is as follows:

*Shipped north for planting in spring of 1879.*

	Bushels.
From Tangier sound and tributaries .....	353,750
Nanticoke river and Fishing bay .....	125,000
Little Choptank river .....	125,000
Great Choptank river .....	375,000
Eastern bay .....	62,500
Chester river .....	250,000
Anne Arundel county waters .....	112,500
Patuxent river and tributaries .....	150,000
Potomac river and tributaries .....	625,000
Total .....	2,178,750

"The average price paid was 7 cents a bushel. Owing to the action of the state legislature, at its last session, in forbidding the catching of oysters after April 15, the shipments from Maryland waters in the spring of 1880 were much smaller than for the previous year."

ESTIMATES OF SHIPMENTS IN 1879-80.—The estimates made of shipments from Maryland waters to northern ports from May 31, 1879, to May 31, 1880, are compiled by Edmonds, as follows. I think they are hardly to be closely relied on, or of much value, but I annex the table:

Shipped to—	For planting.	For immediate consumption.	Total.
	Bushels.	Bushels.	Bushels.
Portland, Maine .....	9,000	75,000	84,000
Fair Haven, Connecticut .....	66,000	50,000	116,000
Providence and Providence river .....	110,000	30,000	140,000
Boston .....		80,000	80,000
Delaware bay .....	488,880		488,880
Philadelphia .....		162,960	162,960
Seaford, Delaware (for packing and for local use) .....		200,000	200,000
New York .....			650,000
			1,921,840
Per rail and steamers .....			100,000
Total .....			2,021,840

I have thrown distrust on this table, because I hardly think it possible to tell, with any accuracy, what went north from Maryland waters and what from Virginia.

SHIPMENTS NORTHWARD IN 1865.—In 1865 Mr. C. S. Maltby counted the shipments northward as follows:

Fair Haven, Connecticut .....	700,000
New York .....	1,050,000
Philadelphia .....	400,000
Boston, Massachusetts .....	350,000
Total .....	2,500,000

The vessels engaged in carrying oysters from the Chesapeake to the North are generally owned in the cities to which they run; and it would duplicate statistics to include them in the oyster-fleet of the Chesapeake. It would, however, be equally an error to make no mention of them at all. From the best information to be obtained by correspondence with the owners of the vessels, I would put their number at 200, with a present aggregate value of \$600,000. About 1,000 men compose their crews, and the wages of these will amount to about \$140,000 a season.

The oysters taken North for immediate use cost, on an average, about 25 cents a bushel; while plants, during the past season, probably averaged 10 cents a bushel, about 3 cents more than the price during the previous season.

The dismissing of this subject will be excused by the reader, who has access to and has read the previous chapters, which treat of the use of Chesapeake "seed" and oysters in the waters of the Atlantic states.

**BEGINNING OF OYSTER-PACKING IN BALTIMORE.**—"Having given an account of the oystermen, their boats, etc.," says Mr. Edmonds, "it is now appropriate to present some statistics of the number of bushels of oysters caught and the disposition made of them. The most important factor in this connection being the packing-trade, I will endeavor to show the extent of this business, as compiled from the books of the different firms engaged in it.

"About 1834 or 1835 a small packing-house was opened in Baltimore, but it soon passed out of existence, and no record of it can now be obtained. The first important enterprise in this line was the establishment of a packing-house in 1836, by Mr. C. S. Maltby, a native of Connecticut. Mr. Maltby, who, by the way, is still in the business, confined his operations exclusively to the raw trade for a number of years. As his business increased, he established a line of wagons from Baltimore to Pittsburgh, and was thus enabled to supply the west with fresh oysters long before the Baltimore and Ohio railroad had stretched out its track to that then distant region.\*

**BEGINNING OF STEAMED OYSTERS.**—"Mr. A. Field was the first to develop in Baltimore the steam trade. He began a few years after Mr. Maltby. His oysters were steamed and then hermetically sealed in small tin cans.

"Having been once established, the trade increased quite rapidly, and for some years oyster-packing, both raw and steamed, was very profitable;† but as there is an abundant chance of financial success through dishonest means, with but little danger of detection, many unscrupulous firms engaged in the steamed-oyster business, and by packing 'light weights', *i. e.*, putting in a one-pound can about six or seven ounces of oysters, and filling the remaining space with water, and about the same proportion of oysters and water in larger cans, and either selling them under some fictitious brand, or else entirely omitting any name, they succeeded in gaining for the packing-trade of Baltimore a by no means enviable reputation. To enable them to compete with these 'tricks in trade', reliable houses were in some cases forced to follow their example, as in many places it was found impossible to sell standard goods at fair prices, while 'light weights' could, of course, be sold at much lower figures. In answer to the question as to whether 'light weights' were sold extensively in the west, I was lately informed by a gentleman from that part of the Union, that up to within a year or so it had been almost impossible to obtain full weights, but that some improvement had lately taken place in this respect. The same gentleman, on returning to the West, sent me the names of three packing-houses whose names appeared on the cans, and whose oysters were 'light weights'. An examination proved the names to be fictitious, there being no such firms in Baltimore.

**THE UNION OYSTER COMPANY.**—"Close competition, by causing a cutting in prices, helped on the trouble, and for several years previous to 1878 the business was very unprofitable. In 1878, to save themselves, the packers formed a combination known as the 'Union Oyster Company', embracing all the leading firms engaged in the steaming business, with the exception of three or four, who, having well-known standard brands, preferred to fight it out alone. The formation of the Union Company was, in itself, an evidence that the trade was in a deplorable condition. The company was established with a capital of \$300,000, the stock being divided among the twenty-three firms who entered it in proportion to the amount of business previously done by them. The affairs of the company are managed by a president, a vice-president; a secretary, and the twenty-three firms, who constitute the board of directors. In joining the company each firm entirely relinquishes their own steaming business (although they may still conduct the raw trade) and act merely as agents for the union. All oysters are bought and packed by the union, and then sold to the packers at a uniform price, thus placing every firm on exactly the same level. At the same time the union may sell directly to the trade.

"The result of this combination has been to partially break up fraudulent packing, although it is still carried on to some extent. Outside of the union there are three or four extensive firms, whose oysters sell on the reputation of their brands, and it would obviously be impolitic for them to engage in packing light weights.

**THE RAW OYSTER PACKING-HOUSES.**—"The raw-oyster business has always been more profitable and less subject to the vicissitudes of trade, although there are many losses from spoilt oysters when the weather happens to turn suddenly warm. Raw oysters, after being opened, are packed in small air-tight cans holding about a quart, and

\* In 1850, according to memoranda furnished by C. S. Maltby, there were six houses engaged in packing oysters, to the extent of 400,000 to 500,000 cans a year. The price was \$7 a dozen, and five to ten cases to one purchaser was considered a large sale. Fruits, etc., were packed to a still larger value by the same houses.

† Mr. C. S. Maltby records that in 1865, 1,875,000 bushels of oysters were packed raw in Baltimore, and 1,360,000 bushels were preserved. In 1869 he numbers in Maryland 55 packers who, at 500 to 2,500 cans per day, put up twelve to fifteen millions of cans in a season of seven months, using 5,000,000 bushels. Sixty "raw" houses that year employed 3,000 hands, while the packers gave employment to 7,500 persons. Large quantities of canned oysters were annually sent, at that time, by steamship to Havana. In 1872 the same notes record as opening oysters, 2,000 men; making cans, 300 men; box-makers, 50 men; clerks and laborers, 300. All these were in the "raw" trade of Baltimore.

these are arranged in rows in a long wooden box, with a block of ice between each row, or they are emptied into a keg, half-barrel, or barrel made for this purpose. When the latter plan is pursued, the keg or barrel is filled to about five-sixths of its capacity, and then a large piece of ice is thrown in, after which the top is fastened on as closely as possible, and it is at once shipped to the West, usually by special oyster-trains or by express. Packed in this way, with moderately cold weather, the oysters will keep very well for a week or ten days. During the most active part of the "raw" season there are daily oyster-trains of from thirty to forty cars from Baltimore to the West, where nearly all the Baltimore oysters are consumed. From the shores of the Chesapeake bay, as far as Detroit, there is scarcely a city or town (connected with any of the great trunk lines) which is not supplied with Maryland raw-oysters. Farther west, and to a considerable extent in European countries, the demand is supplied by steamed oysters. The oysters used in the raw trade are of a finer quality, and consequently command better prices than steamed. In fact, nothing in the shape of an oyster is too small to be available for the 'steamed' trade. And from this arises one of the great sources of injury to the oyster-beds. So long as dredgers are able to sell their entire catch, regardless of the size of the oysters, it will be useless to expect any improvement in the beds. Young oysters of a very small growth can be disposed of almost as promptly as larger ones, and while this is the case, it need not be expected that dredgers will have foresight enough to see the wisdom of throwing all small oysters back on the bars. During the past season the supply of oysters was often insufficient to meet the demand, and the 'steamed' trade was compelled to suspend work for a considerable length of time on account of a scarcity of oysters, all that were received being quickly taken by the 'raw' men at prices which would be unprofitable for steaming.

STATISTICS OF THE BALTIMORE PACKING-HOUSES.—"Baltimore, the great oyster-market of the United States, annually packs more oysters than any other city in the world. It is the great center of the packing-trade, surpassing in that particular all other cities, and yearly handling more oysters than all the other packing points of Maryland and Virginia combined. During the season, extending from September 1, 1879, to May 15, 1880, the number of vessels loaded with oysters arriving at Baltimore, was 9,543 (or a daily average of 37 for the 257 days), bringing 7,252,972 bushels, which would make the average cargo 760 bushels. In addition to the amount brought by sail-vessels, there were 25,000 bushels received by steamers and consigned directly to hotels and restaurants, making a total of 7,277,972 bushels, of which there were packed raw 3,769,353 bushels, hermetically sealed 2,689,939 bushels, and used for city consumption 818,680 bushels.

"Engaged in oyster-packing in Baltimore there are 45 firms, with a capital of \$2,338,300, occupying, in their business, houses and grounds with an estimated value of \$1,360,966. During the summer these firms are generally engaged in fruit-packing, and their capital and buildings are thus in active use during the entire year.

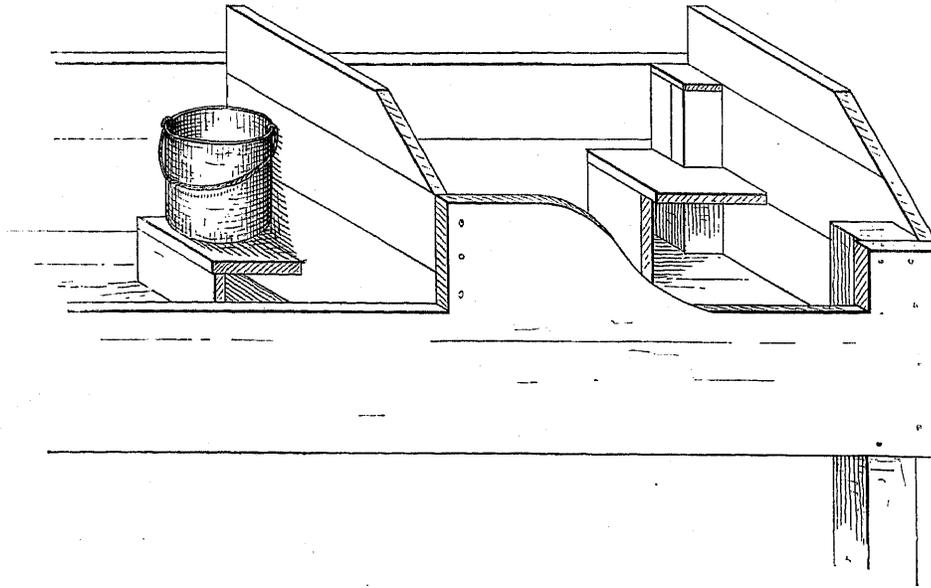
"These firms employ 4,167 males and 2,460 females—total, 6,627; and during the season of 1879-'80 paid to them in wages \$602,427. The total number of bushels of oysters packed was 6,459,292, which required 25,546,780 tin cans and 929,614 wooden cases. The value of the oysters packed, including shucking, cans, etc., was \$3,517,349. For the tin cans \$794,919 was paid, and for the wooden cases \$102,622.

CRISFIELD AS A PACKING CENTER.—"Next to Baltimore, Crisfield is the most important packing point in the state. Had the oyster-beds in the vicinity of Crisfield not been so greatly depleted, I think the trade at that city would have increased much more rapidly than it has. Crisfield is literally built upon oysters, or rather oyster-shells, almost the entire space now occupied by the business part of the city having been under water. The shells from the packing-houses have been utilized to make new ground, and gradually the city has pushed out nearly a half a mile into the bay. At the present time some of the houses are built on piles, and are entirely surrounded by water, having no means of communication with the land except by boats.

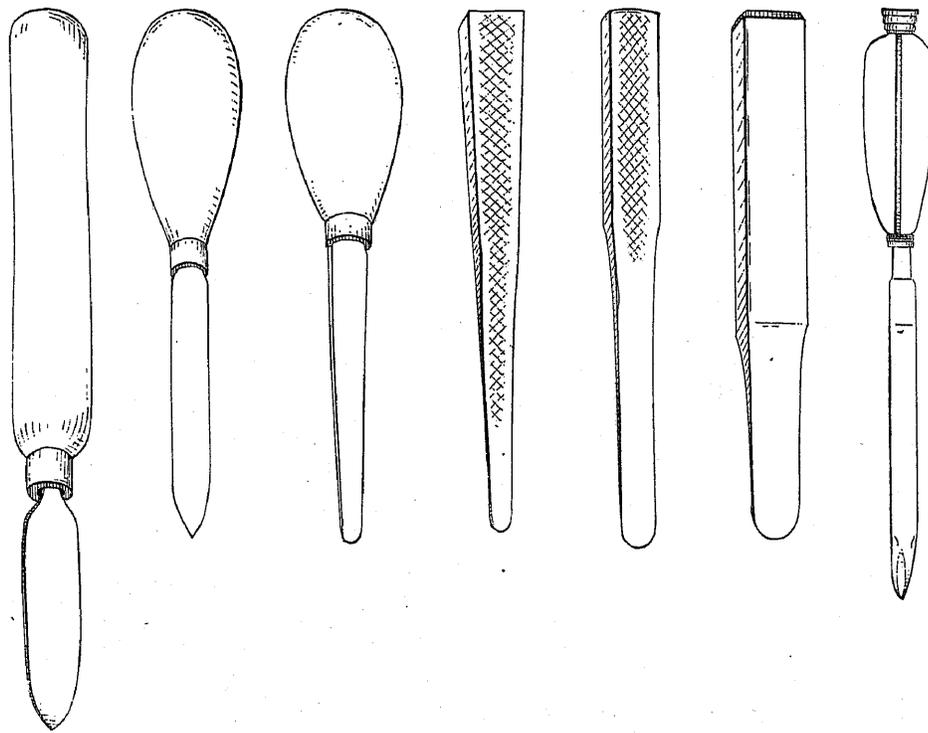
STATISTICS OF THE OYSTER-PACKING IN MARYLAND, 1879-'80.—"From the books of the 98 oyster-packing firms of Maryland, the following table has been compiled, showing the amount of business done at each city from September 1, 1879, to May 1, 1880:

*Oyster-packing in Maryland, season 1879-'80.*

	Number of firms engaged in packing.	Capital employed.	Estimated value of buildings occupied.	Number of males employed.	Number of females employed.	Amount of wages paid, season 1879-'80.	Number of bushels packed raw.	Value of same.
Baltimore.....	45	\$2,338,300	\$1,360,966	4,167	2,460	\$602,427	3,769,353	\$2,273,740
Crisfield.....	16	39,650	23,800	678	.....	65,481	427,270	165,000
Cambridge.....	8	20,300	10,000	385	.....	28,757	205,410	76,638
Annapolis.....	8	50,600	17,500	315	.....	26,482	156,703	69,555
Oxford.....	7	7,000	5,700	156	.....	23,258	108,960	39,986
Saint Michael's.....	4	4,500	3,000	91	.....	4,987	37,788	14,053
Sundry small places in Somerset county.....	10	23,000	15,000	387	.....	26,387	224,817	86,945
Total.....	98	2,492,350	1,486,026	6,179	2,460	777,779	4,930,301	2,725,737



BALTIMORE OYSTER-SUCKING TROUGH.



OYSTER-KNIVES, OF DIVERSE PATTERNS, USED IN NEW ENGLAND, NEW YORK, AND THE CHESAPEAKE REGION.

Oyster-packing in Maryland, season 1879-'80—Continued.

	Number of bushels steamed and hermetically sealed.	Value of same.	Total number of bushels of oysters packed, season 1879-'80.	Total value of same.	Number of tin cans required.	Cost price of same.	Number of wooden cases required.	Cost price of same.
Baltimore.....	2,680,939	\$1,244,009	6,459,292	\$3,517,349	25,546,780	\$794,919	920,614	\$102,622
Crisfield.....			427,270	165,800				3,576
Cambridge.....	13,100	11,820	218,510	87,978				5,840
Annapolis.....	20,152	12,183	176,855	81,738				11,097
Oxford.....			108,900	39,986				1,257
Saint Michael's.....			37,788	14,053				2,530
Sundry small places in Somerset county.....			224,817	86,944				1,890
Total.....	2,723,191	1,268,112	7,653,402	\$3,993,848	25,546,780	794,919	920,614	128,812

"Baltimore is the only place where tin cans and wooden cases are used to any extent, shipments from other cities being made almost exclusively in bulk—in barrels, half-barrels, and kegs—and it was thought better merely to ascertain the cost of these without giving their number.

CHARACTERISTICS OF THE "OYSTER-SHUCKERS."—"As shown by the table, there are 6,179 males and 2,460 females employed in oyster-shucking in Maryland. During the season they receive as wages \$777,779, this being an average of only \$90 06. Very few of the shuckers are regularly at work, and while in one week an expert hand may make from \$8 to \$15, during the next week he may be idle.

"Of the 6,179 males, nearly all of whom are employed in the 'raw' trade, about three-fourths are negroes, the majority of them being comparatively steady workmen, while the whites are more generally disposed to be idle and intemperate. The few whites in the business are generally of a very low class of society. Within the past year a few females have essayed to shuck raw oysters, but their number is still very small, and will probably so continue, owing to the nature of the work. The 2,460 females are all employed in the steam oyster-houses of Baltimore. They are mostly white girls of from sixteen to twenty-five years of age, the proportion of older ones, as well as of colored, being small. These girls are almost without exception of foreign birth or parentage, the largest proportion being of Bohemian origin, with Irish probably coming next. Few American girls, however poor, will consent to engage in this occupation, as in it both sexes must mingle indiscriminately, without regard to color, class, or condition. Owing to the thorough steaming the oysters are very easily opened, and the amount of physical labor required is comparatively light; but during busy seasons the work begins about daybreak and lasts until dark, and is of course exceedingly fatiguing. An industrious hand can make from 75 cents to \$1 a day, but from the great irregularity in their work they are probably not engaged over one-half of the time.

"Considering the class of the people employed in the packing-houses, I do not think it safe to estimate more than an average of two individuals dependent upon the wages of each shucker, at which rate there are in Maryland 17,278 people dependent upon oyster-shucking.

THE OYSTER-PACKING FIRMS.—"It may be well to say that there are about 225 men composing the 95 oyster-packing firms of the state. A noteworthy fact in this connection, is that the large majority of them are of northern birth, and many of them, especially those in Crisfield and the smaller packing towns, reside in Maryland only during the oyster-season, returning every spring to their northern homes. More oyster-packers have come from Connecticut than from all other states combined. It is a somewhat singular coincidence, that both Mr. C. S. Maltby and Mr. A. Field, who respectively established the raw and the steam trade, were both originally from Connecticut, and both are still living, the former in active business. There are about 1,125 individuals forming the families of the oyster-packers.

"During May, June, July, and August the packers of Baltimore are engaged in canning fruits and vegetables; and the same girls who in winter shuck oysters, in summer pare peaches and other fruits. The male shuckers of Baltimore, as well as those of the cities in lower Maryland, having no regular employment in summer, work at whatever odd jobs may be found.

THE MANUFACTURE OF CANS AND CASES.—"The manufacture of cans and cases, an important industry in Baltimore, is so largely dependent upon oyster-packing, that an effort has been made to obtain some statistics pertaining to it, although the exact figures will appear in the census of manufacturing industries. About \$250,000 is invested in the business, which gives employment to 400 men (on oyster-cans), whose wages for eight months amounts to about \$100,000. This estimate is based on the number of cans used, as shown by the returns from the packing-houses, the workmen being paid so much per 100 cans. It was very difficult to obtain any satisfactory

\* Subtracting from this, cost of labor and packing-cases, about \$1,327,000, gives the original cost of these oysters, \$2,166,848. Add to this the value of the oyster "plants" sent north, \$303,276, and you get \$2,470,124. This is not quite the whole product of Maryland waters, however, and in my general summary I place \$2,500,000 as the total value annually of the state.—E. I.

statistics regarding the number of ship-carpenters occupied in building and repairing oyster-vessels, but from an extensive correspondence with ship-builders in various parts of the state, I think it will be placing the estimate too low rather than too high, to say that there are 300 workmen, including carpenters and sail-makers, with yearly wages amounting to \$156,000. As can-makers, ship-yard workmen, etc., we then have 700 men, with about 3,500 people dependent upon them, receiving \$256,000 in wages.

**THE RETAIL TRADE OF BALTIMORE AND OTHER CITIES.**—"It was found impossible to obtain the number of people engaged in the retail trade of Baltimore and other cities, as any statistics gathered from restaurants and hotels would be delusive, since they are not engaged exclusively in handling oysters. Under the circumstances the best estimates that can be made may be deduced from calculations based upon the local consumption in the cities. In Baltimore the city trade is monopolized by a number of commission houses, which handle all the oysters taken for local use, with the exception of the receipts by steamers. From the books of these firms it was ascertained that the sales of oysters from September 1, 1879, to May 1, 1880, for consumption in the city and suburbs, amounted to 793,680 bushels. Add to this 25,000 bushels received by steamers, and the total retail trade is found to be 818,680 bushels. The average price paid for shucking raw oysters is 15 cents a gallon; these being all of fine quality, will open a gallon to a bushel, and hence the amount paid for opening 818,680 bushels would be \$122,802. Estimating the average amount made by the shuckers at \$6 a week, or \$192 for the season, it is seen that there are 640 men steadily employed for nearly eight months of the year in opening oysters for local consumption in Baltimore. There is, in addition to these, a large number of men who sell oysters around the streets; others who rent a cellar room and sell from there; some engage in driving oyster-carts; and a few are employed only during the oyster-season in restaurants as extra help. As near as can be discovered, the number of these may be placed at 500, with wages and earnings amounting to \$96,000. Of these 1,140 men about 800 are negroes.

**CONSUMPTION IN BALTIMORE OF OYSTERS FROM OTHER STATES.**—"In addition to its own stock, Baltimore annually uses a large quantity of 'fancy' oysters from northern cities. The Philadelphia, Wilmington and Baltimore railway, in 1879, carried to that city 273,120 pounds of oysters in the shell, representing about 30,300 bushels. In addition to this, a firm of Baltimore men has lately opened a large establishment near Cape May, New Jersey, whence last fall they shipped about 20 half-barrels of opened oysters daily, during September and October. A similar importation from planting-beds near Providence, Rhode Island, has been heretofore described.

**LOCAL CONSUMPTION OF TOWNS ON CHESAPEAKE BAY.**—"The local consumption of towns on the bay is about 200,000 bushels a season, the shucking of which pays \$30,000 to 150 men. Estimating an average of five to a family, these 1,290 men who are engaged in shucking and selling oysters for local consumption throughout the state, represent an aggregate of 6,450 individuals. Knowing the consumption per capita of Baltimore and suburbs, and calculating that the inhabitants of the tidewater counties consume proportionately at least twice as many, it is easy to obtain an approximate idea of the total number of oysters annually consumed in the state, and not found in the returns from the packers. Of course the interior counties are not considered here, as they receive oysters from the packers which have already been noted. The estimate that the tidewater counties consume locally twice as many as Baltimore in proportion to the number of inhabitants, is based upon careful inquiry among well-informed persons. On this estimate, taking the population as returned by the present census, there are about 875,000 bushels annually consumed in the counties bordering on the bay, in addition to the 200,000 bushels consumed in the towns on the bay. These oysters are generally opened by the families who eat them, and hence there is no expense for shucking.

**OYSTER-CURRENCY.**—"In some of the lower counties of the state, oysters often pass current as money, and in one town there is a weekly paper (subscription price \$1), about 50 of the subscribers to which annually pay in oysters. As the editor thus receives from 100 to 125 bushels of oysters a season, all of which are used in his own family, I readily believe his assertion that he 'was very fond of oysters.'"

#### 47. STATISTICAL SUMMARY FOR BALTIMORE.

**RECAPITULATION OF NUMBER OF MEN EMPLOYED IN OYSTER-INDUSTRY.**—Summing up the total of all engaged in the oyster-trade, we have:

Occupation.	Number engaged.	Wages and earnings of same.	Estimated number of persons supported.
Dredgers .....	5,600	\$916,300	} 54,993
Tongers .....	5,148	1,158,240	
Scrapers .....	2,200	207,000	
"Runners" .....	800	166,400	
Employés of packing houses .....	8,639	777,770	
Can-makers and ship-yard workmen .....	700	256,000	8,503
Preparing for local consumption .....	1,290	248,802	6,450
	24,377	3,820,521	82,229
Individual packers .....	225	.....	1,125
Total .....	24,602	.....	83,354

"In the above enumeration no account has been taken of the number of owners of the dredge, the scrape, and the running-boats, as any attempt to obtain such would be futile, since not even the names of the boats can be ascertained. If it were possible to gather this information, it would swell the above figures to much larger proportions. From the \$1,860,000, the present estimated value of these 1,450 boats (excluding canoes), there must be a yearly profit of at least several hundred thousand dollars. Some of the boats are owned by packers, others by the captains, and the rest are distributed among all classes of society and almost all professions and occupations. When the number of these are taken into account, it will more than counterbalance any overestimates, if such there be, in regard to the number of persons dependent upon the oyster-trade of the state.

STATISTICS OF SEAFORD, DELAWARE.—"Seaford, Delaware, situated on the Nanticoke river, a tributary of the Chesapeake bay, has quite an extensive packing-trade; and as all the oysters are carried from Maryland waters, it was considered advisable to include in this report the statistics of the trade at that city. Mr. D. L. Rawlins, of Seaford, informs me that 'the oyster-packing business at Seaford was started by Platt & Mallory (of Fair Haven) in the fall of 1859. Hemingways, Rowe, and other eastern packers came in 1863 and 1864. They put nearly all their oysters in small tin cans, which they shipped in cases holding about 52 cans each, a good proportion being sent to Fair Haven, Connecticut, to be reshipped from there. The business not proving as profitable as was expected, by 1867 nearly all the original packers had sold out and left, since which time a fluctuating amount of business has been kept up by various successive parties, with alternating failure and success. No cans are used now, shipments being made nearly altogether in bulk'.

"There are at Seaford seven oyster-packing firms, having an aggregate capital of \$14,600, and occupying buildings estimated to be worth \$28,500. From September 1, 1879, to May 1, 1880, 184,500 bushels of oysters were packed raw, giving employment to 170 males and 45 females, the wages of both for the season amounting to \$14,230. The estimated value of the oysters, after being shucked and packed, was \$71,350. When shucked oysters are shipped in bulk, the package (barrel or half-barrel) is returned after being emptied, and then refilled. On this account only 1,400 packages, costing \$1,000, were bought by Seaford packers during the season of 1879-'80. About 400 persons are dependent upon the oyster-trade of Seaford. The local consumption, added to the packing, gives a total of 200,000 bushels handled at Seaford.

CAPITAL AND LABOR EMPLOYED IN MARYLAND OYSTER-TRADE.—"The following general summary of the whole trade in Maryland will give a good idea of its extent:

	Capital in-vested, real and personal.	Number of persons employed.
In packing.....	\$3,928,376	8,639
In oyster-boats.....	2,042,500	13,748
In can-making, etc.....	250,000	700
In local trade.....	*25,000	1,290
Total.....	6,245,876	24,377

\* Estimated.

YIELD OF MARYLAND OYSTER-FISHERY.—"The number of bushels of oysters caught in Maryland during 1879-'80, and the disposition made of them, is as follows:

	Bushels.
Packed in the state, of Maryland oysters*.....	6,653,492
Shipped out of the state.....	2,021,840
Local consumption in Baltimore.....	818,680
Local consumption in other cities of the state.....	200,000
Local consumption in the counties.....	875,000
Imported "fancy" oysters.....	30,000
Total.....	10,599,012

"Exactitude is not altogether possible; the 'round number', 10,600,000, will, therefore, express the total well."

THE PLANTING INTERESTS OF MARYLAND.—The planting interests of Maryland have heretofore been very slight. Now attention is being turned to it more and more. In Virginia, however, considerable planting is done, and under the chapter devoted to that state will be found a study of the planting of the whole of Chesapeake bay. Important experiments are now being made at Saint James, under the directions of Maj. T. B. Ferguson, commissioner of fisheries for the state, who intends to introduce the best methods of European oyster-culture:

STATISTICAL RECAPITULATION FOR MARYLAND:

Number of planters and shippers.....	7,648
Value of shore-property.....	\$1,500,000

\*The total number of bushels packed in the state was 7,653,492, but 1,000,000 bushels came from Virginia.

Number of vessels and sail-boats engaged.....	3, 275
Value of same .....	\$2, 042, 500
Number of men hired by planters or dealers .....	6, 897
Annual earnings of same.....	\$775, 520
Number of women hired.....	2, 460
Annual earnings of same.....	\$259, 259
Number of men in canneries.....	6, 400
Annual earnings of same.....	\$1, 082, 700
Total number of families supported.....	10, 000
Annual sales of—	
I. Native oysters .....	bushels.. 10, 600, 000
Value of same.....	\$2, 650, 000

## 48. THE OYSTER-LAWS OF MARYLAND.

OYSTER-LAWS.—The oyster-laws of Maryland are too voluminous to be given in full, and an abstract has, therefore, been made of them. Before giving this, I quote Mr. Edmonds' remarks upon them and their effect, as follows:

“For the enforcement of these laws an oyster-police force is established, and for the use of the force one steamer and eight fast-sailing sloops are provided; but owing to the character of the laws in force previous to the last session of the legislature, it was impossible for the police force to carry out the purposes for which it was intended. During the fiscal year ending September 30, 1879, the cost of supporting this force amounted to \$44,379 76, while the receipts of the ‘oyster-fund’ for the same time were \$31,969 12, thus leaving the force in debt to the state for that year \$12,410 64. Previous to 1877 the amount received for dredging-licenses had been more than enough to pay the annual expenses of the force; and when this was changed so that the receipts were less than the disbursements, great dissatisfaction was manifested throughout the state. The oyster-police force received the blame, although it did not deserve it. The loss of revenue was occasioned by the fact that more than one-half of the dredging-fleet worked during the past season [1879] without any license. This was mainly owing to the failure of the legislatures of Maryland and Virginia to ratify the report made by a commission previously appointed to determine the boundary line on the Potomac river between the two states. In consequence of this neither state could claim jurisdiction over the waters of the Potomac, and hence dredgers could work without license. Many of the unlicensed boats also caught their oysters in Maryland waters on forbidden ground, and escaped arrest, not through any fault of the police force, but in consequence of defective laws, which made it so difficult to convict the violators of them that it was useless to arrest the dredgers.

“During my investigation of this subject I spent a week on board the police-steamer *Leila*, and about ten o'clock one morning, while on this trip, I was called forward by Captain Travers, the commander of the steamer, to watch the movements of a large fleet of dredgers some eight or ten miles ahead of us. Sixty-three boats were counted, only five of which were licensed. It was useless to arrest any, since they had seen the steamer nearly an hour before she reached them, and had taken in all their dredges. The wet oysters and ropes lying on deck should have been *prima facie* evidence that the law had been violated; but repeated trials had demonstrated that it was impossible to convict the captain of a dredging-boat, unless the officers of the steamer were able to swear that they had seen the dredge hauled up; and not only that, but must also be able to swear that oysters, and not rocks or stones, were brought up by the dredge. These two things were obviously impossible in nearly every case. In many cases the police force were hindered and restricted by the rulings of illiterate magistrates, some of whom, it is said, are interested in dredging-boats, while others are more in sympathy with the dredgers than with the police. Such was the working of the old law. It is to be hoped that the new one will prove of more value, notwithstanding the fact that it is still imperfect. Under the old law the beds were allowed but little rest, tonging and dredging continuing long after the spawning-season had begun. By the new law, however, it was intended that the close-season should be extended, and it was made unlawful to take oysters from the waters of the state ‘between the 15th day of April and the 1st day of September, except for private use, to the amount of five bushels per day, or for sale of the same to any citizen or citizens of the neighborhood, and to them only for the purpose of being consumed where sold, or for the purpose of replanting or bedding in the waters of the counties wherein they are caught, or for sale to the citizens of the county wherein they are caught, and to them only for the purpose of replanting or bedding in the waters of the said counties’. The meaning of this clause being somewhat obscure, the courts have been called upon to interpret it, and by some means they have rendered decisions allowing the tongmen to catch an unlimited quantity of oysters during what was intended to be the close-season.

“The two most important features of the new law are, that the penalty for illegal dredging, which was formerly imposed upon the captain and crew only, is now shared by the vessel, and that the evidence necessary for conviction is made somewhat less difficult to obtain than by the old law. It is, however, still defective, and its force greatly impaired by the insertion of the words ‘on deck’, in section 39, which says: ‘That if any boat or vessel shall be seen sailing over any of the waters of this state which are exempted from dredging by law, in the same manner in which they sail to take or catch oysters with scoop, scrape, drag, dredge, or similar instrument,

the sail-boat or vessel shall be pursued by any officer or officers authorized by this act to make arrests, and if said boat or vessel apprehended by said officer shall be found to have on board any wet oysters on deck', etc. If the law had been framed in the interest of illegal dredging, it would have been hard to make a better loophole of escape than the two words 'on deck'. The dredgers, by keeping a careful watch, can almost invariably have at least thirty or forty minutes' notice of the approach of a police-boat, and in that time it will be very easy to throw all the oysters either into the hold or overboard. After this is done they are safe. It is probable that the change in regard to fines will lead to a better enforcement of the laws relating to dredging, but there will still be many unlicensed dredgers, so long as the question of jurisdiction over the waters of the Potomac remains unsettled. Under the old law the captain and crew of the vessel were held responsible for any violation of the laws, while the vessel was allowed to go free. The captain and crew, if caught, were placed in jail; the former, if a useful man, was bailed out by his employers, his fine eventually paid if the case went against him, and he was placed on the same or another vessel, while the crew were left, often for many months, in jail, simply imposing a heavy expense upon the counties. As many of the dredgers are foreigners, knowing nothing in regard to the laws, it was manifestly unjust to make them suffer for obeying the orders of their captains. At the same time, however, there were others who were not ignorant of the laws, or of the penalties imposed for the violation of them; but were specially trained in various devices and subterfuges, such as would enable them to escape arrest. The crew could not be taken until the captain was seen; if he could not show a license all hands were placed under arrest. Sometimes, when an officer of the police force boarded a vessel and asked for the captain, he was told by the very man who was himself the captain, that the captain was on shore and had all the vessel's papers with him. At other times the captain would escape to the shore in a small boat, and remain hid as long as the police-boat was in sight, even if that was several days. The dredging-boats being well supplied with small-arms, are sometimes disposed to show fight when approached by a police-boat, and in forcing a surrender some of the dredgers have occasionally been severely wounded, and one or two have been killed. Happily, however, occurrences of this kind have been very rare. As a result of the new law which makes the boat responsible jointly with the captain and crew, much of this trouble will probably be avoided.

"From my investigations, I am inclined to think that the police force is well conducted, and that Capt. Sam. M. Travers, commander, did all that could possibly be done to enforce the old law. The blame for illegal dredging should be placed where it belongs—on the framers of the laws, and not on the executors of them."

ABSTRACT OF THE OYSTER-LAWS OF MARYLAND, PASSED JANUARY SESSION, 1880.

CHAPTER 198—Oysters.

SECTION 1. *Be it enacted by the general assembly of Maryland, That chapter 181, of the acts passed at January session, 1874, be, and the same is, hereby repealed, and the following enacted in lieu thereof, to be article 71 of the code of public general laws, title "Oysters".*

SEC. 2. No steamer shall be used in catching oysters in the waters of this state, with scoop, dredge, or similar instrument, and no other boat shall be so used, without first having been licensed as hereinafter provided.

SEC. 3. The comptroller of the treasury shall, upon application of any person who has been a resident of this state for twelve consecutive months next preceding such application, and to no other person, issue a license to such resident to employ such boat in catching oysters with scoop, dredge, or similar instrument, within the Chesapeake bay, and in Eastern bay, outside of a line drawn from the southwest corner of Second Kent point to Wade's point; provided, that nothing herein contained shall authorize the catching of oysters with scoop, dredge, or similar instrument, on any oyster-bar within one and a half miles of Tolley's point, Sandy point, Hackett's point, Thomas' point, Holland Island bar, Three Sisters, Swan Point bar, Poplar island, one-quarter of a mile west of, and between the island and the main-land, nor within a half mile of Plum point, and to buy and sell oysters in this state, which license shall hold good for one year, but shall only authorize the catching of oysters between October 15 and April 1; but it shall be lawful for the owner of any such licensed boat, whenever said owner shall convey by bill of sale for a *bona fide* consideration, said boat, unto any person who has been a resident of the state of Maryland for at least one year, to transfer the said license to said vendee with said boat: *Provided*, The said vendee and assignee shall appear before the comptroller of the treasury and make oath before him to all the facts and prerequisites required, and shall pay \$5 to the state treasury.

SEC. 4. The owner of such boat shall make oath before the comptroller or his clerk, or if the owner be a resident of Baltimore city, he shall make oath before the clerk of the court of common pleas, or if a resident of a county, shall make oath before the clerk of the circuit court of said county, that he is the *bona fide* owner of such boat to be described in the license; that he has been a resident of the state for the time beforementioned; that there is no lien on said boat by a non-resident; and that the said boat is not held with an intention to violate the provisions of this law. Such applicant shall produce before the comptroller, at the time of such application, the certificate of the taking of such oath, the custom-house enrollment or license of such boat; and, if such boat is under custom-house tonnage, the owner shall swear to her tonnage. The master of such boat shall make oath that he has been a resident of the state of Maryland for twelve months next preceding the time of taking such oath.

SEC. 5. Before granting such license, the comptroller shall receive for it, from the applicant, at the rate of \$3 per ton for every ton the boat may measure; and the license shall be exhibited whenever called for by any officer of the state of Maryland.

SEC. 6. Any person who shall violate any of the provisions of the preceding sections shall be deemed guilty of a misdemeanor, and, upon indictment and conviction in any circuit court, or before any justice of the peace of this state, before whom such case is tried, shall be fined not less than \$50 nor more than \$200, or sentenced to the house of correction for a term not less than three months, nor more than three years; and the boat or vessel used in said violation, together with the papers, furniture, and tackle on board of said boat or vessel at the time of the said violation, shall pay a penalty of not less than \$50 nor more than \$200 for each and every violation of the preceding section.

SEC. 7. Upon information given under oath to any judge of the circuit court or justice of the peace, of any violation of any of the provisions of this act, he shall issue his warrant to the sheriff or any constable, requiring them to proceed forthwith to arrest the party or parties alleged to have been engaged in the violation of this act, and to seize and take possession of any boat, canoe, or vessel, together with all her tackle and apparel, and deliver the same to the judge of the circuit court, or a justice of the peace of this state, to be dealt with according to the provisions of this act.

SEC. 8. Any person or persons who shall resist any officer authorized under this act to make arrests, shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be imprisoned in the house of correction for not less than three months nor more than three years.

SEC. 9. It shall be the duty of the sheriff, constable, or officers of the state fishery-force, to arrest any person or persons, and to seize any canoe, boat, or vessel found violating any of the provisions of this act, and bring the offender or offenders before a judge of the court having criminal jurisdiction, or a justice of the peace most convenient or accessible, to be dealt with as herein provided.

SEC. 10. The judge or justice of the peace before whom any person or persons may be brought, charged under oath with violating any of the provisions of this act, shall either give the case an immediate hearing, or shall appoint some early day within the next ten days thereafter, to hear the case, the party or parties charged giving good and sufficient bail for his or their attendance, and on conviction of the offenders, the said judge or justice of the peace shall impose a fine of not less than \$50 nor more than \$200, or imprisonment in the house of correction for not less than three months, nor more than three years, and the boat or vessel used in such violation, together with all the apparel and tackle on board, at the time of said violation, shall be held until said fine and costs are paid; provided, that if said fine shall not be paid within twenty days thereafter, the said judge is hereby authorized to order any sheriff or constable to sell said boat or vessel, with all the apparel and tackle on board, to the highest bidder, for cash, after giving at least twenty days' notice of the time and place of said sale, and the proceeds of said sale shall go to the payment of the fine and costs of such prosecution, and the balance, if any, shall be paid to the owner of said boat or vessel; provided, the said owner shall have the right of an appeal to the circuit court.

SEC. 11. Any boat owned wholly or in part by any non-resident, used in catching oysters in this state with scoop, dredge, or similar instrument, shall be condemned by order of any judge of the circuit court nearest the place of her capture, and shall be sold by the sheriff of the county where condemned; one-fourth of the proceeds of such sale shall be paid to the party making the capture (except the officers of the state fishery-force), and the balance shall be paid into the treasury of the state to be credited to the oyster-fund.

SEC. 12. The fines accruing under this act shall be paid within ten days to the clerk of the county or city where such fine may accrue, and be placed to the credit of the oyster-fund.

SEC. 13. It shall be unlawful, without authority from the owner, for any person or persons to take or catch planted or bedded oysters; any person violating the provisions of this section shall, on conviction in the circuit court of the county wherein the oysters were bedded, be fined not less than \$5 nor more than \$50, or be sentenced to the house of correction for a term not less than three months nor more than three years.

SEC. 14. It shall be unlawful for any person or persons to take or catch oysters, except for private use, to the amount of five bushels per day, or for sale of the same to any citizen or citizens of the neighborhood, and to them only for the purpose of being consumed where sold, or for the purpose of replanting or bedding in the waters of the counties wherein they are caught, or for sale to the citizens of the county wherein they are caught and to them only for the purpose of replanting or bedding in the waters of said counties, between the 15th day of April and the 1st day of September, in each and every year. Any person violating this section shall be deemed guilty of a misdemeanor, and be fined by a justice of the peace of the county wherein the offense was committed, not less than \$50, nor more than \$200, or imprisonment in the house of correction for not less than three months nor more than three years.

SEC. 15. It shall be unlawful for any person or persons to take oysters on Sunday or at night, or to carry oysters in the shell outside the state, between April 1 and September 1.

SEC. 16. The comptroller of the treasury shall have painted in black figures, on white canvas, two sets of numbers, corresponding to the license to catch oysters; each figure shall be 22 inches in length and of proportionate width, and the figures at least 6 inches apart, and he shall give to each person taking out such license two numbers thereof, one of which shall be firmly sewed upon the starboard side, and in the middle of that part of the mainsail which is above the close-reef, and the other number on the port side, and in the middle part of the jib, which is above the bonnet and reef; these numbers shall be placed in an upright position, and worn at all times during the dredging-season, and shall not be concealed or defaced, and no other number shall be exposed to view or used, than that which is furnished by the comptroller.

SEC. 17. Any resident of this state, desiring to use any canoe or other boat, in catching or taking oysters with rakes or tongs for sale, in any of the waters of this state, shall first obtain, by application to the clerk of the circuit court of the county wherein he may reside, a license therefor, and such license shall have effect from June 1, in the year in which they may have been obtained, to June 1 next succeeding; provided that such license shall not authorize the use of said canoe or boat in taking or catching oysters in any creek, cove, river, inlet, bay or sound within the limits of any county, other than that wherein the license shall have been granted, and that the boundaries of counties bordering on navigable waters shall be strictly construed so as not to permit the residents of either county to take or catch oysters beyond the middle of the dividing channel; *Provided*, That nothing in this section shall be so construed as to prevent the citizens of Saint Mary and Calvert counties from using the waters of the Patuxent river in common, or the citizens of Queen Anne and Kent counties from using the waters of Chester river in common, or the citizens of Dorchester and Wicomico counties from using the waters of the Nanticoke river in common, or the citizens of Queen Anne and Talbot counties from using the waters of Wye river and the mouth thereof in common, or citizens of Dorchester or Talbot counties from using the waters of the Choptank river in common.

SEC. 18. Each and every license to take or catch oysters for sale, with rakes or tongs, shall state the name and residence of the person to whom the same is to be granted, the number, together with the length, to be obtained by top, or over-all, measurement of the canoe or boat licensed, the county in which the same is to be used, and the period at which said license will expire, and every applicant for such license shall pay to the clerk of the court where such license may be granted, and before the issuing and delivery of the same, according to the following rates, viz: For any boat measuring in length 20 feet or less, the sum of \$2; measuring from 20 to 25 feet, the sum of \$3; measuring from 25 to 30 feet, the sum of \$4; and all over 30 feet, including sloops under custom-house tonnage, the sum of \$5 each; and all oysters taken with rakes or tongs shall be culled upon the natural beds where they are taken; the amount received from tonging license to be paid to the clerk of the school commissioners, for the public schools in the respective counties where such license is issued; provided, the sum received from white tongers shall go to white schools, and the sum from colored tongers shall go to the colored schools.

SEC. 19. Every applicant for license to use any canoe or other boat in taking or catching oysters with rakes or tongs, shall be required to make oath or affirmation before the clerk authorized to issue the same, or some justice of the peace, on whose certificate of the taking of such oath or affirmation the clerk shall issue said license: that the facts set forth in said license are strictly true; that he has been a

*bona fide* resident of the county for the twelve months next preceding his application for said license; that he desires and intends to use said canoe or boat only in the county in which he resides, or in the waters used in common, as herein provided in this act; that he will not allow the same to be used for taking oysters by non-residents of the county; that he will comply with and obey all the laws of this state, regulating the taking or catching of oysters; and every person to whom such license shall have been granted, shall paint the number of his canoe or boat on the outside thereof, near the gunwale, in black figures, and not less than three inches in length, and of proportionate width, in a white ground, and no number, other than that in the said license, shall be exposed to view on said canoe or boat; and any person failing to comply with this provision before using said boat or canoe for the purpose aforesaid, shall, on conviction thereof before a justice of the peace, be fined not less than five dollars, nor more than ten dollars, and any person who may refuse to pay said fine shall be committed to the county jail for the period of thirty days, or until said fine be paid.

SEC. 20. The comptroller of the treasury shall cause to be printed and delivered to the clerks of the circuit courts of the several counties, the requisite number of such blank licenses; and the said clerks shall, on the first Monday of March and December, in each year, return to the comptroller a list and account of such licenses issued by them; and no licenses to take or catch oysters with rakes or tongs shall be issued to any boat or vessel which is licensed to take or catch oysters with scoop, drag, dredge, or any similar instrument.

SEC. 21. If any person shall use any canoe or boat, not licensed as required by the preceding section of this article, in taking or catching oysters with rakes or tongs, except for private use, he shall, upon conviction thereof, be fined not less than twenty nor more than one hundred dollars; and in case of refusal to pay the said fine, said person shall be confined in the house of correction not less than three months nor more than three years.

SEC. 22. All moneys arising from fines, penalties, or forfeitures imposed under this article shall, upon warrant of the comptroller, be paid into the treasury and placed to the credit of the oyster-fund.

SEC. 23. The owner or owners of any land bordering on any of the navigable waters of this state, the lines of which extend into and are covered by said waters, shall have the exclusive privilege of using the same for protecting, sowing, bedding or depositing oysters or other shellfish, within the lines of their own land; and any owner or owners of land lying and bordering upon any of the waters of this state shall have power to locate and appropriate in any of the waters adjoining his, her, or their lands, five acres, for the purpose of protecting, preserving, depositing, bedding, or sowing oysters or other shellfish; and any other citizen of the state shall have power to locate and appropriate five acres in any waters in said state not located or appropriated; provided, thirty days' notice in writing shall be given the owner or owners, occupant or occupants of land bordering on said water proposed to be located; that the owner or owners, occupant or occupants, may have priority of claim, and if they shall fail to locate or appropriate the water mentioned in said notice within thirty days after receiving the same, then it shall be open and free to any one under the provisions of this section; provided, also, that the said location or appropriation shall be described by stakes, bushes, or other proper and visible metes and bounds, which description shall be reduced to writing under the oath of some competent surveyor, and recorded in the office of the clerk of the circuit court of the county; and provided, also, that such location and appropriation shall not injure, obstruct, or impede the free navigation of said waters; and provided, that no natural bar or bed of oysters shall be so located or appropriated, and that six months' peaceful possession of all locations of oyster-grounds under the laws of this state shall constitute a good and sufficient title thereto; but should any one, within the six months herein provided, be charged with locating or appropriating any natural bed or bar hereinbefore prohibited, the question may be at once submitted, by any person interested, to the judge of the circuit court in the county where such questions shall arise, who, after having given notice to the parties interested, shall proceed to hear the testimony and decide the case, and if decision be in favor of the party locating said five acres, said decision shall be recorded with the original record of said five acres, and shall in all cases be conclusive evidence of title thereto.

SEC. 24. If any creek, cove, or inlet, not exceeding 100 yards at low water in breadth at its mouth, make into the lands, or that if any creek, cove, or inlet of greater width than 100 yards at low-water mark, make into the lands, the owner or owners, or other lawful occupant or occupants, shall have the exclusive right to use such creek, cove, or inlet when the mouth of said creek, cove, or inlet is 100 yards or less in width, and when the said creek, cove, or inlet is more than 100 yards in width at its mouth at low water, the said owner or owners, or other lawful occupant or occupants, shall have exclusive right to use such creek, cove, or inlet, so soon as said creek, cove or inlet, in making into said land or lands, shall become 100 yards in width at low water, for preserving, depositing, bedding, or sowing oysters or other shellfish, although such cove, creek, or inlet may not be included in the lines of any patent.

SEC. 25. Empowers the board of public works to purchase for each of the guard-boats arms and ammunition.

SEC. 26. For the more efficient working of the state fishery-force, the waters of this state shall be divided into seven districts, of which the waters of Kent county and Queen Anne shall be the first; the waters of Queen Anne and Talbot shall be the second; the waters of Dorchester and Talbot, the third; the waters of Wicomico, the fourth; the waters of Somerset county, the fifth; the waters of Anne Arundel county, the sixth; the waters of Saint Mary, Charles, and Calvert, the seventh; each of the said districts shall be guarded by one sailing-vessel, except the third and seventh, which shall be guarded by two; and it shall be the duty of the deputy commander of the first district to guard the waters of Chester river, belonging to Queen Anne county and the waters of Kent county, including Swan Point bar; and the duty of the commander of the second district to guard the waters of Eastern bay and its tributaries, and the waters of Talbot county, as far down as Black Walnut point; and it shall be the duty of one of the deputy commanders of the third district to guard the waters of Choptank river and its tributaries which lay in Talbot county; and the duty of the commander of Wicomico county boat to guard the waters of Wicomico county, and the line between Somerset and Wicomico county; and the remaining commanders to guard their respective districts; provided, that the board of public works or the commander of the fishery-force, are hereby authorized and empowered to order the deputy commanders to do duty in any of the waters in this state, when, in the judgment of either, they may deem it necessary.

SEC. 27. The board of public works shall appoint a suitable person to command said force, to appoint the deputy commanders for their respective districts, and the said commander and deputy commanders shall have power to appoint their subordinates and select their crews; and the term of office of said commander and deputy commanders shall be for two years.

SEC. 28. The board of public works shall have the power to remove any officer of said force for neglect of duty or incompetency, and any officer commanding in said force shall have the power to remove any subordinate under his command, and appoint a person to fill the vacancy whenever the interest of said service may, in his judgment, require him to do so.

SEC. 29. The board of public works shall keep the steamer and said vessels in good order, and the treasurer of the state, upon requisition of the said board, and the warrant of the comptroller, is directed to pay sums necessary to carry out the provisions of this act.

SEC. 30. The commanding officer of the steamer may be selected from the state at large, but the deputy commanders shall be selected from the districts in which they are to serve.

SEC. 31. The commanding officer is required to keep his vessel constantly on duty when circumstances will permit; every locality

where a violation of the law is likely to occur shall be visited as often as the duties of the force and condition of the vessel will allow; and every three months a report shall be made of all official action taken under the law, and of all moneys received for license issued to parties engaged in carrying oysters taken in this state.

SEC. 32. It shall be the duty of the deputy commanders to confine themselves ordinarily to their several districts; but it shall also be their duty to enforce any of the provisions of this act in any waters adjacent to their districts, when a violation of the same shall come to their knowledge.

SEC. 33. Commanders of said force shall, before entering upon their duties, take the oath prescribed by the constitution, and the commanding officer of said force shall enter into bond to the state of Maryland in the sum of ten thousand dollars, and each deputy commander in the sum of three thousand dollars, for the faithful performance of their duties.

SEC. 34. Fixes salaries of commander and various subordinates of police force.

SEC. 35. The officers and crew of the steamer shall each receive one ration per day of the quality and quantity allowed by law to the officers and crew of the Revenue Marine of the United States, but no rations shall be allowed to officers or crews of the sailing-vessels.

SEC. 36. The officers and crews aforesaid shall be paid monthly by the treasurer upon warrant of the comptroller, etc.

SEC. 37. All oysters in the shell disposed of in the state of Maryland shall be measured in a sealed measure of any capacity, from half a bushel to three bushels, that may be agreed upon between the seller and purchaser; provided, that the said measure or measures shall contain in quantity for each bushel thereof, according to the following dimensions, that is to say, 16 $\frac{1}{2}$  inches across, from inside to inside at the bottom, 18 inches across from inside to inside at the top, and 21 inches diagonal from the inside chime to the top, and the same shall be even or struck measure.

SEC. 38. It shall be the duty of the purchaser or seller to have and use said measure or measures, duly inspected and sealed by the proper officers, and no other measure shall be used under a forfeit of \$50 for each and every offense.

SEC. 39. If any boat or vessel shall be seen sailing over any of the waters of this state, which are exempted from dredging by law, in the same manner in which they sail to take or catch oysters with scoop, scrape, drag, dredge, or similar instrument, the said boat or vessel shall be pursued by any officer or officers authorized by this act to make arrests, and if said boat or vessel apprehended by said officer, shall be found to have on board any wet oysters on deck and properly equipped for taking or catching oysters with scoop, scrape, drag, or dredge, or similar instrument, it shall be *prima facie* evidence that the said boat or vessel has been used in violation of this act, and it shall be the duty of the officer to arrest the person in command of said boat or vessel and seize the said boat or vessel, together with all her equipments, and bring the same before a judge or justice of the peace most accessible, to be dealt with according to law; provided, that nothing in this act shall be construed to prohibit vessels from seeking harbor in any waters of this state.

SEC. 40. All oysters taken from any of the waters of this state shall be culled upon their natural bed or bar, under risk of heavy penalties.

SEC. 41. Any person convicted under this act, shall, in all cases, have the right of an appeal.

SEC. 42. Nothing in this act shall be construed to apply to Worcester county.

SEC. 43. It shall be the duty of the commanders of the steamer and sloops to diligently watch and guard, and to arrest all persons dredging, tonging, or scooping without license; and any violation of duty in this respect shall be deemed a sufficient cause of removal.

SEC. 44. Nothing contained in this act shall be construed to affect any prosecutions under the existing law, now pending in this state.

*Laws of 1878, chapter 471.*

SECTION 1. It shall not be lawful for any person or persons to take or catch oysters for any purpose, in any manner, or with any instrument whatever, in the waters of the Patuxent river within the boundaries of Calvert county, between Point Patience and Sheridan's point, in Calvert county, and between Town point and Long point, in Saint Mary county, from the 1st day of May to the 1st day of October in each year after the passage of this act; provided, however, that this act shall not be construed to prohibit the citizens of Calvert county or Saint Mary county from taking from the waters thereof oysters for private use, or for the purpose of replanting or bedding in the waters of said counties, or for sale to the citizens of the county wherein they are caught.

SEC. 2. Upon information given upon oath to any justice of the peace in and for the counties aforesaid, of any violation of the provisions of this act, the said justice of the peace shall issue his warrant for the arrest of the offender or offenders, and the seizure of the canoe or boat in his or their possession, or used in the commission of the offense, together with the tackle, instruments, and all things on board at the time of the commission of the offense.

SEC. 3. Prescribes method of legal procedure for trial and for collection of penalties.

SEC. 4. Provides right of appeal.

*Laws of 1870, chapter 405.*

SECTION 1. *Be it enacted by the general assembly of Maryland,* That it shall not be lawful for any person or persons to rake, drag, or dredge for oysters within five hundred yards of either edge of the new channel at the mouth of Patapsco river, known as the "Craighill channel", extending from the Seven-Foot knoll to the mouth of Magothy river.

SEC. 2. Stipulates proceedings for arrest and punishment of offenders, closely similar to the foregoing laws.

BALTIMORE CITY.—*Laws of 1864, chapter 368.*

SECTION 1. All oysters carried to the city of Baltimore for sale, shall be sold by the sealed half-bushel, or sealed bushel-and-half measure, and each and every person offending against the provisions of this section shall be subject to a fine of \$50 for each and every offense, to be recovered before a justice of the peace of the city of Baltimore.

*Laws of 1874, chapter 221.*

SECTION 1. All oysters in the shell, disposed of in the city of Baltimore, or in the port of Crisfield, or at any oyster-packing establishment in this state, shall be measured in an iron circular tub, of any capacity from one-half bushel to three bushels, as may be agreed upon between the buyer and seller; said measure shall contain in quantity for each bushel thereof, according to the following dimensions, that is to say, sixteen and one-half inches across from inside to inside at the bottom, eighteen inches across from inside to inside at the top, and twenty-one inches diagonal from the inside chime to the top, and the same shall be even or struck measure; all the clerk of the court of common pleas, in Baltimore shall be measured by a licensed measurer. Any person may obtain a license therefor from his duty; said license shall hold good for one year. A measurer shall receive for his services one-half cent per bushel, to be paid equally by the buyer and seller.

SEC. 2. The measure provided for above shall be inspected and stamped by the proper officer in Baltimore, and it shall be unlawful to use any other measure, except for oysters shipped in the barrel on any steamboat, to be sold in the barrel.

*Laws of 1878, chapter 325.*

SECTION 1. The act of January, 1874, relating to catching oysters with scoops or light dredges in Dorchester county, is repealed and re-enacted to read as follows:

SEC. 2. It shall be lawful for citizens of Dorchester county to catch oysters with scoop or light dredge in boats not exceeding ten tons burden, \* \* \* in Honga river, Hooper's straits, Par bay, and that part of Fishing bay which lies to the southward and westward of a straight line drawn from the middle of the mouth of Tedious creek to Clay island light-house, and in all the waters to the southward and eastward of Clay island, in Dorchester county, and adjoining the Wicomico lines up to Sandy island; *Provided*, That no boat or boats licensed under the provisions of this act shall work within 200 yards of the shore; and the board of county commissioners for Dorchester county shall purchase two buoys of proper size and have them properly anchored on said straight line, between Tedious creek and Clay island light-house, and the captain of the oyster-sloop of the second district shall place them in position.

SEC. 3. In order to avail themselves of the privileges of section 2, a license must be procured from clerk of circuit court, good for one year, but not permitting any catching of oysters between May 1 and September 15, following.

SEC. 4. Every such license shall state the name and residence of the person to whom the same is to be granted, the number beginning with two hundred, together with the true tonnage of said boat or vessel, according to the rule of custom-house measurement; and every owner of a boat or vessel shall pay \$2 per ton for every ton said boat or vessel shall measure.

SEC. 5. The board of school commissioners of Dorchester county shall appoint a competent person to measure all boats licensed under this act.

SEC. 6. Measurer must give \$500 bonds, and shall receive 50 cents per ton measured, as compensation.

SEC. 7. Any applicant for a license under this act, shall make oath that he has been a *bona fide* resident of said county for the twelve months next preceding his application for said license, and that he intends to use said vessel only in said county, and that he will comply with and obey all laws of this state regulating the catching of oysters; and any person to whom said license shall have been granted shall paint the number of his boat on each beam, near the gunwales, on a white field, with black letters, seven inches in length.

SEC. 8. Enacts heavy penalties for use of any sort of boat without a license, with right of appeal.

SEC. 9. Directs all moneys arising from fines and forfeitures to be immediately credited to the public-school fund of the county.

SEC. 10. Prohibits taking oysters with scoops or dredges in all waters reserved for tonging.

SEC. 11. Fees allowed clerk of circuit court.

SEC. 12. Adds Great Choptank river to ground privileged to be worked with scoops or dredges.

*Laws of 1868, chapter 228.*

SECTION 1. Prohibits catching oysters "with rakes, drags, or dredge within the waters of Honga river, in Dorchester county, or in the Nanticoke river at or above Roaring point, in Dorchester and Wicomico counties, in quantities over five bushels in any one day" during June, July, and August.

SEC. 2. Forfeitures and fines fixed for violation of the above section to be paid into the school fund.

*Laws of 1876, chapter 396.*

SECTION 1. Forbids catching oysters in Dorchester county during June, July, and August, except five bushels a week for family use.

SEC. 2. Penalties upon conviction of violations: a fine of \$10 and forfeiture of boat and canoe employed; one-half the fines and the proceeds of the sale of the boat to go to the informers, and the remainder to be paid into the free-school treasury of Dorchester county; provided, that nothing in this act shall apply to catching oysters in either the Great or Little Choptank rivers or their tributaries in Dorchester county.

SEC. 3. All boats condemned shall be sold at public auction to the highest bidder for cash, after ten days' notice of the time and place of sale.

*Laws of 1878, chapter 359.*

SECTION 1. Repeals chapter 437, passed January, 1874, and chapter 405, passed January, 1876, and re-enacts as follows:

SECTION 1. The clerk of the circuit court of Talbot or Dorchester county shall, upon the application of any person who has been a resident of such county for twelve months next preceding such application, and to no other person, issue a license to such resident to employ any boat of a capacity of ten tons or under in taking oysters with dredge, scoop, or scrape in the waters of the Choptank river in said counties, for sale to any person, between September 15 in each year and June 1 next following; *Provided*, That nothing in this act shall authorize the taking of oysters with dredge, scoop, or scrape above a straight line drawn from Oyster Shell point, on the Dorchester shore, to the Talbot shore, immediately opposite, or in any tributaries of said river above or below said Oyster Shell point; and provided, further, that the applicant shall pay to said clerk, before the issuing of said license, the sum of \$2 per ton, which said license shall be good for twelve months from the day of its issue; and until such license is obtained it shall be unlawful to use or employ any vessel in taking or catching oysters as hereinbefore described; provided, that the waters of Talbot county lying between Black Walnut point and a line drawn from Tilghman's point to the southwest point of Parson's island, except the waters between Poplar island and the mainland, lying within a line drawn from a point of land on the north side of Ferry cove, known as Lowe's point, to the northern extremity of Poplar island on the north, to a line from the northwest extremity of Tilghman's island to the southern extremity of south bar of Poplar island on the south, which are hereby reserved for the use of tongmen, shall be opened to the citizens of Talbot county, licensed under this act, between September 15 in each year and May 1 next following, but it shall be unlawful to take oysters with scoop or dredge in any other waters of Talbot county; provided, also, that the waters of Choptank river, lying north of a straight line running from Benoni's point to Clara's point, are hereby reserved for tongmen, and it shall not be lawful to catch oysters with scoop, scrape, or similar instrument to the northward of said line.

SECS. 3 to 11. Substantially reproduce the provisions of laws of 1876, chapter 405, heretofore quoted, as to terms of application for license and penalties for violation.

*CALVERT COUNTY.—Laws of 1870, chapter 188.*

SECTION 1. Catching of oysters for sale prohibited in Saint Leonard's creek, Island creek, and Battle creek in Calvert county, except such oysters as have been "imbedded or planted".

SEC. 2. Upon information given under oath, of any violation of this act, to any justice of the peace of Calvert county, he shall forthwith issue his warrant directed to the sheriff, or any constable or military officer, requiring either of them to arrest the party or parties alleged to have been engaged in violating this law, and to seize and take possession of any canoe, boat, or vessel, together with all their tackle and apparel.

SEC. 3. Provides for a speedy hearing before a justice, and forfeitures and penalties in case of conviction, with right of appeal. Moneys so arising to be devoted, one-fourth to the arresting officer, one-fourth among his assistants, and the remainder to the school fund.

*Laws of 1878, chapter 163.*

SECTION 1. It shall not be lawful for any person to take or catch oysters for sale, with any instrument whatever, in the waters of Mill creek, Back creek, or Saint John's creek, in Calvert county, for the period of three years from the passage of this act, except from land in said waters located and appropriated, or which may be hereafter located and appropriated by virtue of any act or acts of the general assembly of Maryland, authorizing the location and appropriation thereof for the purpose of protecting, preserving, depositing, bedding, or sowing oysters, and any person violating the provisions of this law shall be deemed guilty of a misdemeanor.

SEC. 2. For the purposes of this act a line drawn from the steamboat wharf on Solomon's island, and running in a northeasterly direction to Township point on Rousby Hall farm, shall be the dividing line between the mouth of Mill creek and the Patuxent river.

KENT COUNTY.—*Laws of 1872, chapter 359.*

SECTION 1. Any resident of either Queen Anne or Kent county, having in his possession any boat under custom-house tonnage, and desiring to use said boat or canoe in taking oysters for sale, with rakes or tongs, in any of the waters of the aforesaid counties, shall first obtain, by application to the clerk of the circuit court for that county wherein he may reside, a license, such as is now prescribed by the general law, and which said license shall give him a right to take or catch oysters in the waters of either Queen Anne or Kent county; and such license shall have effect from October 1, in the year in which it shall have been obtained, to the first day of October next succeeding, subject to the provisions of the general law as to the time in which oysters shall be caught or taken with tongs: *Provided*, That such license shall not authorize the use of said canoe or boat in taking or catching oysters in any creek, river, cove, inlet, bay, or sound within the limits of any county other than Queen Anne and Kent; and that the boundaries of the counties bordering on navigable water shall be strictly construed, so as not to permit the residents of either of these counties to take or catch oysters beyond the channel of the creeks or rivers lying between these and other contiguous counties; and provided further, that this act shall not authorize the taking or catching of oysters from grounds already located or appropriated for the purpose of preserving, depositing, or bedding the same in the waters of said counties, under the provisions of the general laws.

QUEEN ANNE COUNTY.—*Laws of 1876, chapter 381.*

SECTION 1. The following lines, to wit, from the south point of Wye island to the southeast point of Bennett's point, thence to the south point of Parson's island, are established as a boundary for the protection of the oyster-grounds in that branch of Wye river known as "Back Wye", and the oyster-grounds lying on the land or Queen Anne side of that part of said boundary extending from the southeast point of Bennett's point to the south point of Parson's island.

SEC. 2. It shall not be lawful for any non-resident of Queen Anne county to catch, or in any manner to molest, oysters on Queen Anne's side of the boundary here specified.

SEC. 3. The dividing waters of Wye river, and the waters of Saint Michael river, lying west of the boundary line described in section one of this act, and the waters around Herring island, are hereby opened to the citizens of Queen Anne and Talbot counties in common, for the purpose of catching oysters with rakes or tongs.

SEC. 4. It shall be unlawful for any person to take or catch oysters with scoop, scrape, or any similar instrument, in the waters of Queen Anne county, lying west of Kent island, between Kent's point and Cove point, within 400 yards of the shore.

SEC. 5. Penalties for violation.

SOMERSET COUNTY.—*Code of public local laws, article 19.*

SEC. 91. Prohibits taking oysters for manure in Somerset county.

SEC. 92. Prohibits purchasing any oysters for manure caught in the county.

SEC. 93. Penalties imposed.

*Laws of 1867, chapter 129.*

SEC. 94. Permits citizens of the county to take oysters with a dredge or scoop in any waters of said county not parcel of any creek, cove, river, or inlet, upon obtaining license therefor as hereinafter directed.

SEC. 95. The clerk of the circuit court for said county, upon application of any citizen of said county, shall issue a license to such citizen, authorizing him to take or catch oysters with scoops, drags, or dredges in the waters of said county, subject to the provisions of this law, for one year from the date of said license, for which said license the citizen applying shall pay to the said clerk the sum of ten dollars; provided, that the citizen so applying shall have first satisfied the said clerk that he has obtained from the comptroller of the state license to take or catch oysters in the waters of the Chesapeake bay.

*Code of public local laws, article 19.*

SEC. 96. The person so applying for a license shall first be required to make oath that he is a *bona fide* owner of the vessel to be licensed, that he has been a *bona fide* citizen of the state for one year immediately preceding said application, and six months a resident of the county, and that the license is intended for his use only.

*Laws of 1867, chapter 129.*

SEC. 97. Any person taking oysters within the waters of said county with a scoop, drag, or dredge, without a license, or who is not a citizen of said county, or otherwise, contrary to any law of this state, shall be subject to all the penalties provided by law against the illegal taking of oysters in this state.

*Code of public local laws, article 19.*

SEC. 98. In all cases where a vessel or individual shall be tried under this law and acquitted, the expenses of the suit shall be borne by the county.

SEC. 99. Issue of warrant.

SEC. 100. Fees.

SEC. 101. Money from licenses to be paid to the county school fund.

*Laws of 1878, chapter 373.*

SECTION 1. Prohibits taking oysters with scoops, drags, or dredges, in Wicomico river, in Somerset county, on the eastern side of a straight line from the mouth of Rock creek to Clay island light-house, under liability to heavy penalties and forfeitures.

## TALBOT COUNTY.

(See Dorchester county, laws of 1874, chapter 437; laws of 1876, chapter 405; laws of 1878, chapter 359.)

## WICOMICO COUNTY.

(See Dorchester county, laws of 1868, chapter 228.)

*Laws of 1872, chapter 241.*

SECTION 1. It shall not be lawful for any person to employ any canoe, boat, or vessel in taking oysters with scoop, dredge, or any similar instrument, within the waters of Wicomico county, nor shall any person take oysters for sale within the waters of said county, otherwise than with tongs, as restricted and regulated by the provisions of the general oyster-law in force in this state.

SEC. 2. For the protection of the young oysters in the waters of Wicomico county, it shall not be lawful for any person or persons to convey beyond the limits of said county any oysters from May 15 until September 1 in each year.

SECS. 3, 4, 5, 6, 7. Prescribe penalties and forfeitures, and regulate forms of official proceeding in arrest and trial of offenders.

WORCESTER COUNTY.—*Laws of 1868, chapter 343.*

SEC. 3. Prohibits taking oysters in this county for making into lime.

SECS. 4, 5, 6, 7, 8, AND 9. Prescribe legal proceedings for arrest and the recovery of fees and penalties.

SEC. 10. If any person shall take, steal, or sell planted oysters of another, knowing them to be such, from any of the waters in this act mentioned, he shall, upon conviction in said court, be fined not less than fifty nor more than one hundred dollars, and may, at the discretion of the court, be confined in jail not less than one nor more than six months.

*Laws of 1872, chapter 131.*

SEC. 2. It shall not be lawful for any person or persons, other than citizens or actual residents of Maryland, to haul or fish with any seine or seines of any description, rake or catch oysters, clams, or terrapins, or plant oysters in the waters of Sinepuxent bay or any of the tributaries thereof included in the boundaries of Worcester county.

SECS. 3 AND 4. Refer to seine fishing.

SEC. 5. Provides fines and forfeitures in case of violation; but provides that this act shall not restrict or prevent traders or other persons from purchasing from or selling to non-residents the shellfish in this act mentioned.

SEC. 6. If any citizen of Maryland shall be concerned or interested with any person not resident within this state in the taking, catching, or planting of oysters in the waters of Sinepuxent bay, or in any of the tributaries thereof included in the boundaries of Worcester county, or shall knowingly permit any person not a citizen and actual resident within this state to take, catch, or plant oysters in his name, he shall be liable to the penalties and forfeitures imposed for the violation of the preceding sections of this act, and shall be proceeded against in the same manner; provided, that nothing herein shall be construed to prevent the employment of non-residents as day laborers for the above purposes.

SECS. 7, 8, 9, AND 10. Forms of proceedings against alleged offenders, and disposal of condemned property forfeited.

SEC. 11. In case of persons unlawfully engaged fleeing from their boat, the boat or vessel shall be seized, which shall be condemned, if the evidence shows it to have been illegally used.

SEC. 12. Money thus arising to be paid into the school fund.

SEC. 13. Prohibits taking any shells from the "rocks or flats whereon oysters grow within the limits of Worcester county". Penalty, \$25.

SEC. 14. All oysters in the shell disposed of in the waters of Worcester county shall be measured in a sealed measure of any capacity, from a half bushel to two bushels, that may be agreed upon between seller and buyer. Penalty, \$25.

SEC. 15. It shall be the duty of the purchaser or seller to have said measure or measures duly inspected and sealed by the standard-keeper, under a forfeit of \$25 for each and every offense.

*Laws of 1876, chapter 277.*

SECTION 1. Chapter 77, passed January, 1874, "for the protection of oysters in Sinepuxent bay and its tributaries, is hereby repealed, but all violations of said act may be prosecuted and punished as fully as if said act had not been repealed".

SEC. 2. The clerk of the circuit court for Worcester county may issue to any citizen of said county a license to take or catch oysters with rakes or tongs from the waters of Sinepuxent bay and its tributaries, until the first day of May next after the issuing of said license; provided the applicant for said license shall satisfy said clerk, by his own oath or other sufficient proof, that he is a citizen of said

county, and shall pay to said clerk the sum of one dollar, to be paid by said clerk to the county commissioners of Worcester county, to be expended in the procuring of seed-oysters to be planted in said bay as the commissioners aforesaid may direct, but no person licensed as above, nor any other person, shall take or remove any oysters from the waters of said bay or its tributaries on any Sunday or in the night at any season, nor during the day from the 1st day of May to the 1st day of October, or any shells from the natural rocks at any time; provided, that nothing herein shall be construed to forbid any person from taking or catching his or her own planted oysters at any time and with any kind of instrument.

SEC. 3. No person shall catch, take, or remove any shells or oysters from the natural beds in the waters of Sinepuxent bay or its tributaries with scrapes, scoops, dredges, or drags, or with any instrument in the working of which any other than hand power is used.

SEC. 4. It shall be lawful for any citizen of Worcester county to plant, or for any resident to lay down, oysters on not exceeding five acres in any one place in any of the waters, except upon the natural rocks of the said bay or its tributaries, and that no person, except the owner or his employé, shall work upon or among said planted or laid down oysters; provided, that portion of the said waters so planted in be kept plainly marked with bushes, stakes, or buoys, and any person maliciously removing said bushes, stakes, or buoys, shall be liable to the penalties of this section; and provided, that nothing in this section shall affect the rights of owners of land to the exclusive use of any creek, cove, or inlet, within their said lands, not exceeding one hundred yards in width at its mouth, and any person violating the provisions of this section shall be liable to be sued as for damage to any other property.

SECS. 5, 6, 7. Regulate penalties, forfeitures, and proceedings against offenders.

## P. COASTS OF VIRGINIA.

### 49. OYSTER-FISHERIES AND OYSTER-PACKING.

GENERAL CONSIDERATIONS.—Upon the study of the oyster-interests of the Chesapeake, included within the state of Virginia, several persons contributed besides myself, notably Mr. R. H. Edmonds, of Baltimore, to whom the credit of the Maryland chapter belongs, and Col. Marshall McDonald, of the United States Fish Commission.

The waters of Virginia being in many places separated from those of Maryland by imaginary lines only, it is not to be expected, remarks Mr. Edmonds, 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 facts in regard to the trade, in both states, is the same—that the oystermen are generally poor and illiterate, often intemperate and reckless.

METHODS OF GATHERING OYSTERS.\*—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 fifty to a hundred 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 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 trade is greater in the former state than in the latter.

STATISTICS OF TONGING AND DREDGING IN 1865.—As long ago as 1865, Mr. C. S. Maltby, the great oyster-merchant of Baltimore, estimated that the total annual supply and disposal of oysters taken in Virginia was as follows:

*Oysters taken in Virginia waters.*

Destination.	Dredged.	Tonged.	Total bushels.
Baltimore.....	916, 750	48, 250	965, 000
Washington and Alexandria.....	59, 375	3, 125	62, 500
Boston.....	23, 334	11, 666	35, 000
Fair Haven, Connecticut.....	43, 750	131, 250	175, 000
New York.....		787, 500	787, 500
Philadelphia.....	40, 000		40, 000
Total bushels.....	1, 083, 209	981, 791	2, 065, 000

THE OYSTERMEN OF VIRGINIA.—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

\* Chiefly from notes by Mr. Edmonds.

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 tidewater 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 in Virginia and Maryland, and especially of the former state, is the almost total absence of foreigners. The entire trade may be said to be 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. The business of oyster-tonging is one involving great exposure, hard labor, and some risk, and the men engaged in it are mostly adult males in the vigor of health. 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 very great. Nor does oyster-tonging give returns in proportion to labor expended. The element of chance is a large one. A clear, smooth water, with its opportunities for coving, permits the fisherman to gather in one day what he may not realize by a week's exertion in stormy and tempestuous weather. The influence of these uncertainties upon the habits and thrift of the men is plainly marked, particularly in dislike of steady industry. Few of them ever pretend to work on Saturday, Sunday, or Monday, those days being consumed in going to market and returning, though there is nothing to prevent their going home on Saturday night, or at least on Sunday morning. Many of them have a small piece of land and a house, but their efforts at accumulation do not seem to go beyond living "from hand to mouth".

**THE JAMES RIVER.**—The most productive of all the tonging-grounds, at least in southern Virginia, are doubtless those of the James river. Go anywhere in it, from its mouth up nearly to Jamestown, and you will catch oysters. There are certain "shoals", however, where the oystermen usually work. Such a one was visited recently by a correspondent of the *New York Times*, who records what he saw as follows:

The shoal from which the Dennis was loaded extended over about 500 acres, and from this shoal, on the day that she was loaded, not less than 10,000 bushels of "plants" were taken. To do this about 250 oystermen were employed, with about 100 boats. And this business of gathering plants had been going on from off the same shoal for upward of two months, with the probability that between 300,000 and 400,000 bushels of oysters have been gathered, and fully 200,000 bushels more will be taken away before the season ends, on May 20. This gives a yield of 1,000 bushels to the acre, and yet nowhere on all this shoal would it be possible to find a spot as large as a set of tongs will cover without oysters on it. The tongs are never pushed down and pulled back without bringing with them a number of oysters. In September the oystermen will begin work again on the same shoals and work for three or four months catching plants; then, during the winter until the 1st of April, they are engaged in taking up, assorting, and selling the products of these plants. It seems as if the supply of oyster-plants in the James river could never be exhausted, yet the oystermen say they are growing less and less each year; but if they are correct in this assertion, it is difficult to conjecture in what abundance these oysters must have been when they were plenty.

To see the oystermen balancing themselves in one of their canoes, and working with so much energy at the same time, was quite a novelty. Many of these canoes are so narrow that should a novice step into one it would most probably be overturned; yet the oystermen work in them all day long in smooth weather, and sometimes in pretty stormy weather, and apparently keep them properly balanced without any effort. To propel them through the water they use a long paddle, and, balancing it over the stern (the canoes, of course, are sharp at both ends, having no row-locks and no indentation to aid them in keeping their paddle in place), they move them swiftly.

**STATISTICS OF THE VIRGINIA OYSTER-FLEET.**—No records are 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 tidewater counties, and gaining as near an estimate as possible, Mr. Edmonds 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 their estimates as to the number of canoes in their respective counties. Many of these gentlemen, he reports, went to considerable trouble to work up the matter, and by their aid he was enabled to correct some of his own figures, and he considers he is 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 he 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. Rasha 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 ten tons register, while there are very few of the other fourth that will register as high as fifteen 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 on same.	Number of larger vessels.	Men on same.	Total number of men.
Accomac .....	545	925	282	1, 176	2, 101
Elizabeth .....	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	944
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

NUMBER OF OYSTERMEN IN VIRGINIA.—Of the total number of tongmen there are 5,906 colored and 5,954 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. About 200 white men, with wages amounting to \$83,200 a year, are employed in building and repairing oyster-vessels, making cases, etc.

PROFITS AND EARNINGS.—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.

CANOES AND BOATS.—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 \$460,950, 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. 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.

OYSTER-PLANTING AT LYNNHAVEN BAY.—To the business of planting oysters Virginia men devote much more attention than do the residents of Maryland. The planting consists of little more, however, in any case, than the simple transferring of young "seed" oysters in the rough shape in which they are dredged from the beds of natural growth, to certain spots where ground has been staked off as private property, and where they grow under better conditions than in their native state. The extensive operations and elaborate methods of the northern states are not to be found in these waters.

The southernmost, and at the same time one of the most famous localities for oyster-planting in Virginia, is at Lynnhaven, just inside of Cape Henry. The wide reputation and acknowledged superiority of the oysters raised in this river and bay led Col. M. McDonald to examine particularly into the methods pursued there; and he has kindly placed at my disposal the succeeding memoranda:

Lynnhaven river is simply a branching arm of Chesapeake bay, and has been made by the tidal ebb and flow. It is fed by very little surface-drainage, the rain waters of the back country finding their way into it by percolation through the porous subsoils that form the banks. When the tide is out the fresh water flows out on all sides by infiltration, and dilutes the salt water in the coves and all along the shores. When the tide is at the flood the saltness is in a measure restored. It is to these incursions of fresh water twice in 24 hours, that the extreme fatness and flavor of these oysters are probably to be attributed.

Oysters for planting are obtained from Back bay and Linkhorn bay, tributaries of Lynnhaven river, in which there are natural beds. They are also obtained from spawning-coves in the river itself. Oysters from James river and other localities have been tried, but have not done well.

The seed-oysters are carefully separated and planted evenly and thinly over the bottom, by a careful hand-sowing, broadcast, with a shovel. Any bottom will suit, provided it is not sandy, so as to shift with the action of the tide and bury the oysters, and is not too soft to bear their weight. They remain in the beds six years or more, and are then sent to the market, where they bring from \$5 to \$7 per barrel, or from \$2 to \$3 per bushel. They are disposed of almost wholly at retail, in the shell, over the tables of saloons and hotels as "fancy" stock.

The amount now planted in this river is about 200,000 bushels. The amount marketed varies, of course, with the demand. For this year (1879-'80) it is estimated by Mr. Joshua Garrison, one of the largest planters on the river, at 25,000 bushels, and the planters receive on an average \$2 per bushel.

All the coves of the river and a greater part of the bed are occupied by plants, and it will probably be found in the future that they have overtaxed the capacity of the river.

Summarizing, we credit Lynnhaven bay with 25,000 bushels, valued at \$50,000.

OYSTER-PLANTING AT CHINCOTEAGUE.—Another point where planting has long been carried on successfully, is at Chincoteague bay on the ocean side of the peninsula. As described briefly by Mr. Edmonds, 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 10 to 20 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.

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 usages of northern markets.

OYSTERING AT CHINCOTEAGUE IN 1865.—The correspondent of the *New York Times*, whose letter I quoted a few pages back, accompanied the schooner to Chincoteague, describing the operations witnessed. Greenback is a town situated near Franklin, on the Chincoteague bay, the southern terminus of the Old Dominion Steamship Company's railroads on the peninsula. Nearly every man living in Franklin, and every one in Greenback, depends on the oyster-business for his support. Both of these villages have grown up since the war, Greenback being the older place. It was so named by an old oysterman, one of three or four who first planted in the bay in front of the place, because the first season's shipment of oysters returned to the oystermen such a rich reward in greenbacks. This was in 1865, and since then the quality of the oysters produced in this part of Chincoteague bay has been so generally good, that they have made a favorable impression on European shippers. Following is the quotation:

When the Dennis had secured 3,500 baskets—called by the courtesy of the oystermen half-bushel baskets, but really holding over two-thirds of a bushel—the captain pronounced her loaded, and then all energy was used in getting under way, because the sooner the plants are returned to the water after they are removed from their natural beds, the less will be the mortality among them. In 36 hours after leaving the James the Dennis let go her anchor on the planting-grounds off Greenback, and one day sufficed to place all her cargo on the beds, staked out, and, by Virginia laws, made the private property of those who so marked them. They will be left to remain on these beds for upward of eighteen months, and, although many of those planted will die before the gathering time, yet it will be a poor return that will not give to the planter a bushel and a half for each bushel planted, and sometimes as high as three and four bushels have been gathered from each bushel of plants. These plants cost the planter in Virginia 5 cents per bushel, and about 6 cents to freight, and, perhaps, 2 cents to plant, making 2,500 bushels of plants cost but about \$300.

The cost of taking these oysters up and preparing them for the market is about 20 cents per bushel, and as 2,500 bushels will almost always return 4,000 bushels, it will be seen at once that those planters who have favorable planting-grounds, have it always in their power to make their energy pay them a good profit. At no time for the past ten years have Chincoteague bay oysters sold, delivered on board of vessels in the bay, for less than 50 cents per bushel, and mostly for 60 cents. At the lower rate it will be seen that any one at Greenback, possessed of a working capital of \$1,000, can realize a profit (if he owns share-privileges) of \$800 a year from it, with a chance of doing much better. Doubtless such also is the case in all the bays and coves celebrated for their fine oysters, yet many places along the James and in the Chesapeake bay grow as fine looking oysters as can be produced anywhere, and quite popular at home, that will not sell for enough to warrant the expense of planting.

OYSTER-INDUSTRY OF HAMPTON AND VICINITY.—In Hampton, and Elizabeth City county generally, Colonel McDonald spent much time in investigation of the oyster-industries, and reports as follows:

The fleet of larger vessels that fish, from Hampton, consist of 13 vessels, sloops and schooners, averaging about 25 tons burden. These vessels employ 50 skiffs and 100 men, and allowing the same average per man per season as deduced from the actual operations of

a crew in 1877, viz, 1,300 bushels, we have as the estimated product of this oyster-fleet 130,000 bushels. The number of canoes and small sloops engaged in tonging for oysters in Hampton and Elizabeth City county, may be safely reckoned at 150. The number of men engaged is about three to the boat, or 450 men and boys, each of whom takes an average of 400 bushels as his year's catch.

The planting interests in Back river, Hampton, and Mill creeks will add to the foregoing product about 30,000 bushels.

Summarizing Colonel McDonald's figures, I get:

Number of registered vessels.....	13	
Number of small craft .....	200	
		213
Number of men engaged on vessels.....	100	
Number of men in small craft.....	450	
		550
Bushels of oysters marketed.....	310,000	
Bushels of oysters from plants.....	30,000	
Total crop.....	340,000	
Value, at 20 cents per bushel .....		\$68,000

Further particulars of this region appear as follows:

Back river is the dividing line between Elizabeth City and York counties. It was once extensively planted with oysters, and the product bore a good reputation and brought good prices. For some reason the ground became unproductive—attributed by my informant to over-planting—and only in the last two or three years has it begun to recover. At the present time about 10,000 bushels are planted annually. The capacity of the planting-grounds is estimated by Mr. Booker at 100,000 bushels. Poquosin river, a few miles to the northeastward, in York county, has a planting capacity of about 175,000 bushels. The amount annually planted there is from 25,000 to 30,000 bushels, and the amount obtained by tonging from the commons is about 5,000 bushels.

NATURAL AND ARTIFICIAL BEDS IN HAMPTON ROADS AND JAMES RIVER.—From another gentleman, described as a “planter of intelligence and varied experience”, Colonel McDonald obtained information which enabled him to plot upon his charts all of the natural “rocks” and the planting-grounds in Hampton roads and the James river. The plantings specified, with their products, are these:

In Mill creek back of Fortress Monroe:		Bushels.
Now planted.....	5,000	
Capacity .....	10,000	
On Hampton flats, between Newport News and Hampton creek:		
Now planted.....	5,000	
Capacity.....	400,000	
In Hampton creek:		
Now planted.....	10,000	
Capacity.....	10,000	
On edge of Channel, back of Ripraps:		
Now planted .....	5,000	
In Willoughby bay, back of Ripraps:		
Now planted.....	50,000	

Up the James river are a few plants—probably 25,000 or 30,000 bushels—but thousands of acres are available for planting which, in a few years more, will be brought into productiveness.

METHODS OF OYSTER-CULTURE ABOUT HAMPTON.—The seed for this cultivation is chiefly obtained in the James river, and the favorite points are high up the river near the upper limit of the natural-growth of the oyster, which limit is at the Deep Shoals light-house, a few miles below Jamestown. The effort is always to get round, single, deep, thin-shelled oysters for planting; the smaller the better, if they can lie until of mature growth. The tongs employed are of three sizes—24, 32, and 36 inches in breadth of “head”. They are of the ordinary pattern. The size employed depends upon the rankness of growth of the bed. Where single, or “cove”, oysters are sparsely scattered over the bottom, a small pair of tongs, with eight or ten inch jaws, is employed to gather them. The use of these is impracticable, however, unless the water be clear and smooth, so that the oysters can be “sighted”, or seen and aimed at. This can readily be done in water from 4 to 7 feet deep. Such oysters are large, fat, and of good shape; they class as “selects”, and bring “top” prices in the market, from 60 cents to \$1 per bushel. The seed is obtained by the tongmen, who work with their own canoe or tools, or by the planters, who hire crews and equip boats of their own to go after seed. In taking the oysters for planting, little or no culling is usually attempted. The cost of planting oysters (culled) varies from 10 to 40 cents per bushel, depending upon the character of the seed. Rough oysters—the run of the rock—may be planted for about 5 cents a bushel.

The amount planted on a given area is regulated by the time they are to lie. For one year about 30 square feet is allowed to the bushel; when the plants are to lie for two years about 40 square feet to the bushel. Where the oysters are simply shifted to fresher water to fatten, and lie but a few months, several thousand bushels to the acre are often laid down. Ordinarily, the increase after lying fifteen months is one-fourth; for small single oysters it is double, or 100 per cent. The rate of growth will vary with location and other circumstances. The best judges, at Hampton, think that plants ought not to lie less than two years in order to get the best results.

THE "GREEN-GILL" DISEASE.—In 1880 what the oystermen call the "green-gill" began to affect the planted oysters in Back river, and Colonel McDonald inquired carefully into it. He learned that it began with the oysters lowest down the river and traveled up the stream. It was supposed by the planters to be due to the extremely dry weather, which caused the water of the river to be unusually salty, since the condition appeared first where the water was saltiest. When the oysters of Back river were similarly affected many years ago, one man moved several hundred bushels around to the Bay-shore, and allowed them to remain some time in the salty waters of the bay without producing any change. The *salient* fact, if true, is that the change began in the salt water. Furthermore, it is observed that this peculiarity only affects them when they are fat. The existence of it does not impair the quality of the oysters, but it does materially affect the sale, because people generally are ignorantly afraid of it.

PREJUDICIAL OYSTER-LAWS.—One other feature of this district calls forth remarks from Colonel McDonald, which I quote herewith:

The Hampton flats furnished a notable example of a condition of things that is beginning to prevail extensively in Virginia waters. Formerly they were covered with a natural growth of oysters that had great reputation and commanded a high price in the markets. They lay right at the doors of Hampton, and gave profitable employment to her fishermen; now these flats are exhausted, and though possessing a productive capacity of nearly half a million bushels annually under judicious planting, the law of the state prohibiting planting upon "oyster rock", keeps them barren, when an annual income of not less than \$125,000 is possible. There are not now, nor is it likely there ever will be again, any natural, wild oysters growing there. Yet 2,500 acres of fine planting-ground, at the very doors of the oystermen is compelled to lie idle through shortsighted prejudice.

OYSTER GATHERING AND PLANTING IN YORK RIVER.—For information in regard to the oyster-fisheries and industries of York river, I am again indebted to Colonel McDonald, whom I quote:

York river is the common estuary of the Mattaponi and the Pamunkey rivers. It is a broad arm of the Chesapeake, some 30 miles in length. At the head of it stands West Point, the terminus of the Richmond, York River and Chesapeake railroad, whence lines of steamers ply to New York, Boston, and Baltimore. The average width of the river is about three miles. At its mouth, between Yorktown and Gloucester point, the width rapidly contracts to less than 1,200 yards. Through this narrow gorge the tide rushes with great velocity and has scoured out the channel to the depth of nearly 80 feet \* \* \*

The natural oyster-rocks of York river are now insignificant, compared to former days, and most of the oystermen who formerly worked on this river every season, now go to the Rappahannock and the James. Relatively, the oyster-planting interests are of greater importance, yet are insignificant now compared to what they were ten years ago. At that time the high price of oysters caused overplanting, which led to the impoverishment of the planting-grounds, while the sudden fall in prices ruined most of those who were engaged in the business.

The plants for this river are obtained in part from James river, the larger part from the Potomac, and cost to bring and lay down from 15 to 20 cents a bushel. The same conditions of "greening" characterize the oysters in this river as in Back river. The greening begun with those lowest down the river, and has traveled up. Captain Van Pelt states as a curious fact, that green oysters have never been found on the York side higher up than Sandy point.

The planting grounds extend to about 25 miles above Yorktown, and are occupied by 15 or 20 planters, who raised about 350,000 bushels for market during the past season. The ruling price was 35 cents, which would make the total value \$122,500. Including the hired help, a hundred families probably make a living out of oyster-planting in York river, with the help of tonging, clam-digging, and various land-occupations. The product goes in schooners to the New York and Boston markets.

PLANTING IN THE RAPPAHANNOCK.—In respect to the Rappahannock, what has been learned of the planting-interests is rather discouraging. The extent of ground under use is a strip along the flats on both sides, averaging 100 yards in width. These extend from Ware's wharf or Russell's rock, which is about eight miles above the light-house, to the mouth of the river. The seed comes chiefly from the natural beds in the Rappahannock and Potomac rivers, with a few from elsewhere. The planters are roughly estimated by Mr. B. L. Farinholt, of Montagues, Essex county, Virginia, who kindly gave me much information on this district, at about a thousand; and taking into account the tongers who sell exclusively to the planters, and others employed, Mr. Farinholt thinks no less than 5,000 men are supported by this industry. Many of these persons come to the river from elsewhere to work during the season, but very few are hired at stipulated wages in any capacity.

Last season the planted crop is roughly estimated at about 400,000 bushels, which sold at an average price of 50 cents. The season of 1880-'81 was an exceptionally profitable one. Mr. Farinholt writes me in conclusion, as follows:

Planting is largely on the increase. The natural beds are rapidly being destroyed, oysters are becoming scarcer, and prices are increasing from 20 to 25 per cent. each year for plants. Unless the season for catching is made shorter, or some heavy tax is laid on, or both together, it is my opinion that within a few years this interest will become a very small one on this river, simply from the depletion and destruction of the natural beds.

THE PACKING-TRADE OF VIRGINIA.—The packing-trade of Virginia is of much later origin than that of Maryland. About the year 1859 Mr. Edmonds states that Mr. Edward Fitzgerald opened an oyster-packing establishment in Norfolk; but the war coming on, 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. Mr. Edmonds' report upon this phase of the oyster-business in Virginia is very complete, and I quote him as follows:

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 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 oysters give employment to a large number of workmen.

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. 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:

Packed at—	Bushels of raw oysters.
Crisfield, Maryland.....	427, 270
Cambridge, Maryland.....	205, 410
Annapolis, Maryland.....	156, 703
Oxford, Maryland.....	108, 960
Saint Michael's, Maryland.....	37, 788
Sundry small places, Maryland.....	224, 817
Total.....	1, 160, 948
Norfolk, Virginia.....	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 light business is done, but too small to be noted separately. 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.

Table showing the packing trade of Virginia for 1879-'80 (by R. H. Edmonds).

	At Norfolk.	Elsewhere in Virginia.	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, etc., used.....	16, 871	1, 000	17, 871
Value of same.....	\$11, 119	\$1, 939	\$13, 058

Since Mr. Edmonds' visit to Norfolk, a large steaming-house has been put up there by representatives of the Union Oyster Company of Baltimore. This employs many hands, additional to the number counted above, and uses a large quantity of oysters which otherwise would rot, or at least not find sale to the "raw" houses. This conduces to the general prosperity of Norfolk, in that it makes the chance of selling at some price more certain than before, and thus induces a larger number of boats to come to the town and do their trading as well as sell their catch there. The steaming-house also gives employment to many girls and women. Previously, very few females had been employed in the packing-houses of Norfolk, but of the 501 shuckers in other parts of the state, 244 are females. I suppose this new establishment would add at least 10 per cent. to the totals of the above-given table; but as I have no precise figures, I prefer not to enter into the summary of statistics.

SHIPMENT OF OYSTERS IN THE SHELLS.—Although I have added from other sources a large additional amount of local particulars, no better statistics are available for Virginia than those furnished by Mr. R. H. Edmonds, in connection with his report on Maryland. The summaries will be found in the succeeding tables :

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

To—	For plant- ing.	For imme- diate use.	Total.
	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>
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, etc.....	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

YIELD OF VIRGINIA OYSTER-FISHERIES.—The number of bushels of oysters caught in the state during the year, and the disposition made of them, may be summarized as follows :

	Bushels.
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 counties of the state.....	1,625,000
Total.....	6,837,320

STATEMENT SUMMARY.—The average value of these oysters from first hands, would be about 28½ cents a bushel, or a sum total of \$1,948,636 20. This is shown, by sections, in the following statement:

Department of work.	Capital invested.	Number of people employed.	Wages and earnings of same.	Estimated number of people dependent upon the trade, cal- culating four to each worker.
Planting.....	\$586,300			
Packing.....	286,850	1,528	\$200,951	
Tonging.....	224,050	8,660	1,772,000	
Running.....	460,950	5,376	1,022,172	
Local trade.....	10,000	300	57,600	
Building oyster-vessels, etc.....	50,000	200	83,200	
Total.....	1,618,150	16,264	3,135,923	65,056

Reducing this to the formula for summary used heretofore, it presents itself as follows:

STATISTICAL RECAPITULATION FOR VIRGINIA:

Number of packers, planters, and tongers.....	10,439
Value of shore-property (about).....	\$50,000
Number of vessels and sail-boats engaged.....	1,317
Value of same.....	\$460,950
Number of canoes and skiffs.....	4,481
Value of same.....	\$224,050
Number of men hired by planters or dealers.....	500
Annual earnings of same.....	\$140,800
Number of sailors employed.....	5,376
Annual earnings of same.....	\$1,022,172
Total number of families supported.....	16,264
Annual sales of—	
I. Native oysters..... bushels..	6,837,320
Value of same.....	\$1,948,636

## Q. THE SOUTHERN ATLANTIC COAST.

## 50. THE OYSTER-PRODUCTS OF NORTH CAROLINA.

GENERAL ASPECT OF THE INDUSTRY.—In North Carolina the business in oysters and oyster-culture is of small proportions, and is confined almost wholly to the Neuse river, Beaufort, and Wilmington. The census of 1860, imperfect, of course, in both estimates, gives North Carolina only \$2,100-worth of oysters, compared with \$53,145 credited to Virginia, and \$15,305 taken in Maryland. The inside of the outer "banks", or the long line of beaches that protect the inner submerged area of nearly fresh water from the demolishing force of the ocean, is lined with oyster-growth to a greater or less degree along its whole extent, but these oysters are not always either edible or available for commerce. Currituck sound was closed from the ingress of salt water forty years ago, and of course all marine life has died out there. Albemarle sound is said to be the largest body of fresh water in the country, except the Great Lakes, and sometimes sweetens the water clear down to Roanoke island. Pamlico sound, on the contrary, has inlets from the Atlantic which make all its water, at least along its eastern half, thoroughly saline, and permits a luxuriant oyster-growth. This is availed of by the simple fishermen of these desolate beaches and islands in a way that shows how a primitive custom may survive for many years after the commonwealth in which it grew up has passed on to something more complicated and better fulfilling the same purpose. Of these fishermen there are about 300 between the middle of Core sound and Roanoke island, as I am informed by Mr. R. E. Earll, of the United States Fish Commission. Mr. Earll tells me that every winter, at intervals in their fishing, or in connection with it, all of these fishermen are wont to take partial loads of oysters, gathered on the outer banks, to the shore and river towns, perhaps 20 or 30 or more miles away, and there dispose of them, not for cash, but by a system of barter. The exchange is ordinarily made for corn, and the rate last winter was one bushel of oysters in the shell for one bushel of Indian corn in the ear. Taking this, together with what the families of the fishermen eat, and these people live on oysters the year round, and with small interruption, Mr. Earll considers that forty and perhaps fifty thousand bushels a year, worth, perhaps, \$10,000, reckoned in money, would not be too large an estimate to put upon this consumption. One obtains from such a picture as this an appreciation of the importance of oysters, and the oyster-trade, to the people who live in the neighborhood of the beds, and of which little or no statistical account can usually be given.

THE VICINITY OF BEAUFORT.—The first point of inquiry, which develops any systematic or commercial use of oysters, is in the vicinity of Beaufort and Morehead City, which lie at the lower end of Core sound, and on opposite sides of Newport river, whose mouth and inlet from the ocean form Beaufort harbor, and separate Core sound on the north from Bogue sound on the south. The oysters brought to Beaufort come chiefly from the two sounds mentioned. They are almost always of natural growth, but the transplanting of seed has been done at a good many different points, and there will, no doubt, be considerable cultivation in a few years. An attempt was made in 1880 by a Baltimore firm to establish an opening-house at Beaufort, but inclination or circumstances caused its removal to Newberne. There is little regular business at Beaufort, therefore.

I am in receipt of a letter from Dr. H. C. Yarrow, United States army, containing some notes on the oyster-interests in this locality in 1864. Dr. Yarrow writes:

At the time I was in Beaufort the oyster was not cultivated, and all I can tell you is, that the best ones were found about 25 or 30 miles west of Fort Macon, in Bogue sound. These oysters, which were famous, brought 40 cents a bushel; ordinary ones only 25. Good oysters were also got up the North river and in a river, running a little north of Harkness island, which is near Cape Lookout.

NEWBERNE.—More facts are to be ascertained at Newberne, where more business is now done. Newberne gets its oysters from various points in Pamlico sound. The marshes of the lower part of the Neuse are full of them, but little or no use is made of this seed. Bay river, on the shore of the mainland, gives a good thin-shelled and white oyster, with a deep "cup" and fine flavor, but the freshets in the Neuse are likely to ruin these beds. Smith's creek is also a very good locality, and oysters of very fine flavor are caught opposite Fort Smith, but contain a great many crabs. Good single oysters, capable of being made very fine by planting, are reported to abound in the vicinity of the Royal Shoal rocks. Other good localities are Point of Marsh and Broad creek. The objection to all Core sound oysters is, that though of fine shape and good flavor, they do not seem to thrive under transplanting. However, this may be a libel upon them, since none but the crudest experiments have been made in cultivation. There is no reason to doubt that it would succeed grandly, and with comparatively small trouble, for I have rarely seen shells come up so completely overgrown with infant oysters, as are those which are brought to Newberne. There is little hope that the fishermen themselves, who now live along the shore and work upon the beds, will ever become cultivators to any extent. Whether outside capital will ever find it profitable to undertake oyster-planting in these apparently highly favorable waters, depends upon a dozen outside considerations of market, means of transportation, possibilities of procuring labor, etc., which it would be futile to discuss, because they are constantly changing. It appears then that all the oysters—with occasional exceptions—sent to market from this district, are taken from the natural beds without any intermediate process of transplanting, or fresh-water fattening.

**NORTH CAROLINA OYSTERMEN.**—The men who supply the oysters are partly fishermen, few of them expecting to derive as much as half of their support from this occupation. In all, I suppose there are from 300 to 400 men tonging more or less in Pamlico sound, but it is out of the question to arrive at any definite average of what each one earns. The main cash receipts go to the hundred or so chief oystermen. The boats are the same ones used in the general fisheries, and will average \$200 to \$250 in value. They belong chiefly in Core sound, and in all there are perhaps 50 or 60 of them. In spite of this array of natural resources, men and boats, only about 25,000 bushels were landed at Newberne, and about 5,000 bushels more at Beaufort, during the winter of 1879-'80. It is said that about half as much more (say 15,000 bushels) were bought by peddlers alongshore, who carted them back into the country and sold them from their wagons. The total production of this district, therefore, is about 45,000 bushels, which would be increased to 50,000 bushels if we counted the immediate consumption on the shore. Not only ought there to have been raised from the water a very much larger amount than this, when we consider the great area of the beds and the number of men employed, but a vastly larger amount would have found an immediate market at Newberne. There are two or three persons there who regularly ship in the shell as many good oysters as they can procure. Besides this there has recently been opened a shipping-house, which would be glad to consume 1,000 bushels a day during all of the cooler half of the year, if they could only obtain the stock. But unfortunately, the general laziness and improvidence of the oystermen are so great, that it is impossible to make a contract and expect to fill it. Not only has it proved extremely difficult to obtain oysters in sufficient quantity, and at the time they were needed, to make the running of this new packing-house profitable, but when by good luck a stock was on hand, there was incessant danger that the men hired as shuckers might suddenly desert their employer, without a single compunction as to their duty or responsibility under the circumstances. When it is cold, or the weather is at all rough, no one of these North Carolina oystermen can be persuaded or driven to go to work, notwithstanding that the beds are near shore and well sheltered, and in spite of his manifest poverty. The fact that some discomfort will attend his raking, is reason enough for him why he should stay home and sit over his miserable fire. Yet it is in cold and stormy weather that the buyers are most anxious to get oysters, and will pay a higher price, because then there is not only a greater demand produced by general scarcity, but the frosty air sharpens the appetite of their customers.

The question of labor in opening presented an obstacle to success of the same nature. These men are paid by the gallon, and it was found that no reliance could be placed upon a large number of them. Both white men and colored were employed, but the latter have proved the more reliable of the two, and have nearly superseded white help. Many men would come to the house, beg to be taught the art of opening oysters, which was new to most of them, and be set at work. For the first few days the novelty would keep them pretty steadily employed, then suddenly, when perhaps their assistance was most needed in filling an order, they would knock off. After that their promises proved worth nothing, and no reliance whatever could be placed upon their staying longer than was necessary to earn the 15 or 20 cents which would buy them a little corn meal and tobacco, to keep themselves and their families from starvation for a couple of days. So impossible have the proprietors found it to improve these lazy, unbusiness-like habits of the people, upon whom they must rely for their stock and their labor, that Newberne is likely to lose the benefit of an industry which, in a different community, would distribute much needed money among hundreds of families of the poorer classes.

Some oysters bring as high as 50 and 75 cents a bushel in Newberne and Beaufort, but the average price during this last winter was not above 35 cents, if quite as high as that. At this rate the 50,000 bushels credited to the district was worth \$17,500.

**THE USE OF OYSTERS FOR MANURE.**—I must not omit to mention a custom which prevails in Pamlico sound in summer, and which has been described to me by Mr. Earll. It seems that when the weather becomes too warm for the fishermen to safely carry their catch to market, and there is no other employment for their boats, they catch up boat loads of rough "coon oysters" and carry them to the farmers up the rivers to be sold and used as manure. They receive from 3 to 5 cents a bushel for this strange, but doubtless highly nutritious, fertilizer, but what is the total amount thus gathered and spread on the land each season, I am unable to estimate.

**OYSTERING ABOUT NEW RIVER.**—South of Newberne and Beaufort oysters grow in nearly all the inlets, but there is no regular production until New river is reached, about half way between Beaufort and Wilmington. The main location of the raking here is right opposite Sneed's ferry, beginning two miles from the bar and extending for three miles. The water here is only brackish, and of a uniform depth of about 9 feet. The crooked channel is full of "oyster-rocks". The oysters are of large size, fairly regular shape, and for the most part single. They possess a most pleasing flavor; but when now and then storms drive the salt water up the river, their excellence departs and the oysters take on a greenish appearance, locally called "green-gill". When in this condition they are not considered fit to be eaten, but the disaffection soon wears off.

The oystering here is done in skiffs, of which from fifteen to twenty are constantly busy for four or five months in the spring. As there are two men to each skiff or canoe, from 30 to 40 families get a living from the tonging. The law permits every man owning a water-front to inclose a large space of the adjoining bottom, if he wishes to plant oysters. About a dozen persons have taken such plots and raise planted oysters, but the total crop this year will probably not exceed 2,500 bushels, and this stock was inferior to the natural growth. All these oysters, wild and planted, are sold to carters, who buy them at \$1 a bushel, or from 60 to 80 cents a gallon, for a large part of the

whole product is opened there to prevent the carriage of the extra weight of shells. The wagoners carry them to interior towns and peddle them at various prices. It is thus that Wilmington is supplied, and the retail price there is \$2 a bushel. Wilmington also receives oysters in small quantities from Myrtle Grove sound, where some experiments in planting have just been begun about two miles northeast of Fort Fisher. These are small, but fat and very choice specimens. Another point whence oysters of good reputation come, is Winbury, on Topsail sound. It is difficult to come at it, but I judge that from fifty to sixty thousand bushels is an estimate of all that the production of the New river and Wilmington region would require annually. Out of the perhaps 50 men who busy themselves regularly in this industry, as tongers, openers, carters, or shippers, there are none who are not also largely engaged in other sources of daily bread. It is believed by those best informed upon the subject, that the state law which prohibits dredging within the state is an injury rather than a blessing to the oyster-beds. They are probably right. Under proper restrictions which shall save the privilege from abuse—something hardly to be apprehended in this case, owing to the geographical conditions—dredging would aid both in the extension of the oyster-bearing areas and in the better production of good single oysters on the grounds where they now grow, but in a coarse, bunchy way. The permission of dredging might bring some evils, as in the Chesapeake, but the benefits following to North Carolina would probably overbalance any harm.

STATEMENTS FOR NORTH CAROLINA.—Reviewing this, furnishes estimated totals as follows, for the whole state:

Number of planters and tongers .....	1,000
Number of shippers .....	10
Value of shore-property .....	\$15,000
Number of vessels .....	90
Number of small boats .....	800
Value of fleet and tools .....	\$53,500
Number of shoremen hired .....	10
Annual earnings of same .....	\$1,300
Families supported, partially .....	1,000
Native oysters annually sold .....	bushels.. 170,000
Value of same .....	\$60,000

#### 51. OYSTER-FISHERIES OF SOUTH CAROLINA.

CHARLESTON AND VICINITY.—At Charleston all the business is confined to a little desultory planting around Sullivan's island, and it is doubtful if there is any shipping of oysters done there whatever. The same is true of Port Royal; and I am convinced that 50,000 bushels, worth perhaps \$20,000, would supply the yearly demand of the whole South Carolina coast. The interior towns of the state derive their supplies from the North or else from Savannah.

#### 52. OYSTER-FISHERIES OF GEORGIA.

SAVANNAH.—A somewhat unsatisfactory report of the oyster-business in the neighborhood of Savannah, was all that it was possible for me to obtain during my stay there; but it is a small industry at best, though the most important producing and shipping point on the southern coast.

Savannah is situated upon bluffs on the banks of the Savannah river, just where the salt meadows and sea islands give place to the mainland. In the Savannah river, itself, no oysters grow above the immediate mouth. This is due to the great volume of fresh water which it pours out. In time of freshet, the red, turbid current is visible 25 or 30 miles at sea, and so completely freshens the water to the very outlet, that oysters will not flourish. Off Potato point, however, and in the shape of two elongated banks, marked by beacons, in mid-stream, oyster-beds are to be found, and are raked for seed, or, more than that, for marketable oysters, which are brought to Savannah. These beds in Tybee roads are mainly tonged by colored men, who are fishermen at other times, or do it in a desultory way. Their number and catch varies endlessly.

RACCOON OYSTERS.—But everywhere in the thousand channels which intersect the marshy islands that border the coast, making a perfect net-work of salt-water tide-ways, the raccoon or bunch oysters grow in endless profusion. Let there be old shells, sunken fragments of castaway stuff, logs, or anything upon which it is possible for an oyster to catch, and it will be surely covered with the young shells before a single season has gone by. The oysters spawn here regularly from April till June, and scatteringly till a much later date. So prolific of spawn are they, and so favorable seem to be the conditions for their safe growth, that such an object as an old shell will become completely coated with the infant bivalves. As these grow (and with great rapidity) they sink and gather in the mud, and crowd each other for lack of room to enlarge. All these effects produce their slender and irregular shape, they being able to increase only in the narrow, outward direction. Before they are half grown a second season bestows upon them a new collection of young oysters, which must struggle in a similar way, and thus there arise clusters or bunches or columns of oysters, sometimes three or four feet high and several inches thick, which are closely agglomerated and of very heavy weight. These are called raccoon or 'coon oysters, and are collected, knocked to pieces, and sold in market, chiefly by colored men. Though some of them will not furnish a meat much larger than the thumbnail, they are sweet and well flavored when brought from a good locality.

PLANTING FOR THE SAVANNAH MARKET.—No oysters were planted for the Savannah market until about forty years ago, when, it is said, the first attempt was made by Mr. Andrew Nelson, who is still engaged in the business at Vernonburg. Now there are planted beds, also, alongside of his, in Burnside river and at Thunderbolt, about five miles south of the city.

The Thunderbolt planters go for their seed chiefly into Wilmington river and Wassaw sound, and particularly along the southern end of Tybee island. The Vernon and Burnside planters go down the Vernon river and into Ossabaw sound, especially along the northern end of Ossabaw island, and at the southern point of Big Wassaw. Here they tong up their seed into batteaus, the water being so deep in some places as to require 18-foot handles. The law of the state prohibits dredging, or "any other instrument than the oyster-tongs heretofore in general use". These tongs do not differ essentially from those made and used in the north. Only a portion of the seed obtained for planting, however, is tonged up from the deep-water beds, where it occurs singly, or nearly so. A larger portion is obtained from the shores of the various sounds and salt-water channels, and consists of incipient bunches of raccoon oysters. At low water the planter takes a bateau and four men and goes to the shore where he designs to work at the time of low water. Getting out upon the exposed mud, one or two of the men pull or rake up out of the mud the small bunches of oysters imbedded there, and the rest follow after and pick them up. The instrument used is a rude piece of iron of convenient length, bent at one end so as to act (as it is called) as a "hooker". Old wagon-tire is a favorite material out of which to make this instrument. One of these bateaux will carry 100 to 200 bushels, and four men can often fill it in a tide, breaking the bunches in pieces as they pick them up.

GEORGIA OYSTER-LAWS.—It is only recently that the state has given legal sanction to oyster-culture. The law is brief, but very much to the point, and reads as follows:

Where any person having taxable lands on the banks or shores of any of the rivers or creeks of this state, shall plant beds of oysters upon them, it shall not be lawful for any other person to take from such beds of oysters: *Provided*, the same shall be distinctly staked or marked.

When an oyster-bank, or beds of oysters, or natural formations, be within rivers or creeks, not exceeding 125 feet in width, and not used for purposes of navigation, the persons having the ownership of the lands on both sides of such creeks or rivers shall have the exclusive right to the usufruct of such banks or beds of oysters as aforesaid.

PRE-EMPTION METHODS.—Under this law large amounts of public marsh and islands have been staked off, much of which (it is widely complained of) is not properly done, since *bona fide* planting is not carried on, nor are taxes paid. The truth of this charge of abuse, which must only exist by common consent, I did not investigate; but heard several planters say that large portions of their most accessible seed-grounds had been thus shut off, compelling them to go a long distance, with much labor and pains, for their "plants". The boundary marks used are stakes, upon which is nailed a board with the letter "O" painted upon it. One of these oyster-signs at the mouth of a narrow creek would prohibit any boat gathering oysters above it; and it seems to be universally respected, except by the vagrant negroes, who catch and sell oysters when they want a little money to prevent utter starvation, or to pay for some sport.

METHODS OF CULTURE.—The seed thrown overboard is mainly about a year old; smaller takes too long to grow, and a much larger growth will not survive transplanting. There are two classes of beds—shore-beds, going dry at low tide, and channel-beds, always covered—the latter producing the finer oysters. The bottom is mostly clay mud. After two years the oysters are taken up, the marketable ones picked out, and the rest thrown back; then another lot of new seed is thrown on the same bed. A regular rotation of planting and harvesting stated beds is not followed, and the best oysters obtained are of scraggy, poor shape (even where single), rough shell, and small size. I saw almost none which would pass in New York as "box". Nevertheless, they are of pretty good flavor, though not so salt as one would expect, and of too dark a tint to look as inviting as they taste. Of those I tried, I like the Vernon samples best; Thunderbolt seems not to have so clear a stream. They are usually four years old when taken to market.

Each of the planters has a small hut built upon posts at the edge of the water, where he opens his oysters. In these houses he opens almost all of the stock he sells, and only takes the meats to town, receiving about fifty cents a solid gallon. The method of opening is the same as that used in New York, the knife and handle being of one piece, and the latter very heavy. The shells are used to make causeways from the land to these huts, and also to build roads. Two fine driveways, each several miles long, extend out of Savannah, which have been paved with oyster-shells.

Each oysterman owns a sloop, the hull of which is skiff-shaped and not at all handsome. They are only half-decked, in many cases, but have a little cabin aft, and a hatchway to the hold; they are far from beautiful boats, but are worth an average of \$200 each. In this part of Georgia there are perhaps a dozen of these vessels in the oyster-business, only one of which, I believe, is registered at the custom-house.

EXTENT OF TRADE AND CONSUMPTION IN SAVANNAH.—In respect to the city trade, it is only to be said that three or four men handle the majority of all the oysters brought to the city, and ship them throughout this state and South Carolina, Charleston competing very feebly. Very few oysters come from the North, perhaps 50 barrels

a year in all. These are wholly in the shell, and go to the restaurants. In the case of every dealer, oysters form only a portion of a general fish-trade, and so cannot be counted as "supported" by dealings in them.

It was very difficult to arrive at any just estimate of the annual consumption of oysters in and through Savannah. From what I could ascertain, I judge the yield of the transplanted beds to be less, rather than more, than 15,000 bushels. If you add another 15,000 bushels of raccoon oysters gathered, I think the total will account for all brought to Savannah. A planter told me he received 50 cents a gallon for opened oysters, and \$1 per bushel for the best single oysters. A leading dealer gave me present wholesale prices as 60 cents to \$1 per gallon, and \$2 50 a barrel for shell-stock. I suppose the value of the 30,000 bushels estimated to be handled annually in Savannah, may be given as \$25,000.

LOWER GEORGIA.—Below Savannah all the sounds and lagoons and river-mouths are more or less obstructed with oyster-reefs, and furnish many good raking-grounds. The denizens of Darien, Doboy, Saint Simon, Brunswick, and Saint Mary, all procure oysters from their near neighborhood at small prices. Some intentions of planting were once entertained at Brunswick, and I heard of an old county-ordinance that prohibited all outsiders from tonging there.

#### STATISTICAL RECAPITULATION FOR GEORGIA:

Number of tongers, planters, and wholesale dealers .....	300
Value of shore-property .....	\$5,000
Number of boats .....	100
Value of same, with gear .....	\$13,500
Number of shuckers hired by planters or dealers .....	50
Total number of families partially supported .....	200
Annual sales of—	
I. Native oysters .....	bushels.. 70,000
Value of same .....	\$35,000

#### 53. OYSTER-INTERESTS OF EAST FLORIDA.

FERNANDINA AND VICINITY.—This abundance becomes more and more noticeable as you approach Fernandina, Florida. Every bit of sunken log in the marshes, each fallen tree whose branches trail in the water, and row-boat stake, becomes at once loaded down with "coons". Frequently large specimens are obtainable, and such are very good, as I proved, but they are rarely eaten, and no attempt whatever is made to utilize the easily obtainable seed for transplanting. There is no legal protection or proper sentiment to encourage planting. If a boat-load is brought in and laid down over night, even, the probabilities are that it will be stolen. Fernandina, then, gets all its home oysters from beds 10 to 15 miles distant, where they grow large and singly: the favorite spot, at present, is Crooked creek, over towards Saint Mary. The oystermen are colored fishermen, and no estimate can be formed of the total catch. The price they receive is \$1 per barrel. In addition to this an uncertain amount of better oysters are brought to Fernandina from Cedar Keys, by rail.

On the point of land terminating Old Fernandina are remains of an extensive Indian shell-heap; and in the bottom of the harbor opposite the marshy shore between the old and new towns, was formerly an exceedingly large bar of raccoon oysters. Latterly these have died, and now they are being washed up and are forming a long, firm shell-beach. Here, as in Georgia, the barnacles appear to be troublesome.

SAINT JOHN'S BAR.—At the bar or mouth of Saint John's river good oysters are obtained, though of a very salty taste. They are eaten locally and sent now and then to Jacksonville by the fishermen. Jacksonville, however, is supplied chiefly by Cedar Keys and Apalachicola, the latter, in my opinion, sending the best oysters sold in Jacksonville. The amount consumed is not large, and it frequently happens that the city will be wholly unsupplied. Nobody seems to make an exclusive business of oyster-sales.

SAINT AUGUSTINE.—At Saint Augustine the oyster-supply is chiefly derived from the immediate shores, since they are abundant everywhere. They are, as a rule, small and poor, the best coming from Matanzas, some miles below. They sell them to cart-men who peddle them about the streets. The supply is irregular and uncertain, and no planting whatever is practiced, or is demanded. Not more than 5,000 bushels a year, probably, are ever sold. The boats used by the fishermen in oyster-gathering are small dug-out canoes.

I did not go down to Indian river, but have been informed that in many parts of the great system of estuaries which extends from the upper end of Indian river down to Bay Biscayne, there are oyster-beds yielding edible mollusks of large size and good flavor. I am willing to believe it.

Beyond a reminder that everywhere occur unlimited quantities of small, crowded 'coon oysters, at present undesirable to eat, but always available as seed, and that undoubtedly it only requires further exploration to bring to light many more good localities for gathering edible oysters, I close the account of the-eastern part of Florida, and with it dismiss the Atlantic coast of the United States.

## R. THE GULF OF MEXICO.

## 54. OYSTER-INTERESTS OF WEST FLORIDA.

GENERAL CONSIDERATIONS.—The Gulf of Mexico presents an area of profuse and widespread oyster-growth, and of considerable commercial interests. Though the extent of coast is large, and the points of noteworthy production are scattered, yet the whole Gulf can conveniently be considered together. In addition to my own hasty investigations of this region, I am afforded the assistance of two very competent gentlemen—Mr. Silas Stearns, of Pensacola, Florida, and Mr. Franklin F. Ainsworth, of New York, whose contributions are specially and thankfully acknowledged, as they severally appear in the ensuing account:

EARLY ABUNDANCE OF OYSTERS.—The immense abundance of oysters and oyster-reefs on the western coast of Florida, astonished the earliest explorers, and their histories of explorations contain many allusions to it. Charlevoix went there (or along the reefs) two centuries ago, and writes in his *Voyages* (II, 1255):

But this Coast is the Kingdom of Oysters, as the great Bank of *Newfoundland*, and the Gulph and the River *St. Lawrence* are that of the Cod-Fish. All these low Lands, which we coasted as near as possible, are bordered with Trees, to which are fastened a prodigious Quantity of little Oysters, of an exquisite Taste: Others, much larger and less dainty, are found in the Sea in such Numbers that they form Banks in it, which we take at first for Rocks on a Level with the Surface of the water.

The trees to which Charlevoix's men found oysters attached were mangroves, and a short discussion of the service these mollusks are doing in aggrandizing the commonwealth and territory of Florida will not be out of place.

SOUTH FLORIDA.—Among these now commercially worthless reefs of oysters, various beds or "rocks" have been found, supplying those which are edible and locally put on sale, or at least sought by the shore-people from time to time. Excellent oysters, lying singly and of large size, are thus found at several points in Whitewater bay, at Cape Romano, Gordon's Pass, and in Charlotte harbor. These are the beds which supply the "shell" market of Key West\*, the greater part coming from Punta Rassa (a steamer landing), and gathered in that vicinity for the most part among the mangrove islands between Pine island and Sanibel island. The average number shipped from Punta Rassa is 5,000 a week from October 1 to April 1, making 120,000 (by count) in all. At \$6 50 a thousand these are worth \$780. Occasionally lots of 5,000 to 6,000 oysters are received from Caximbus bay, which are sold at auction, generally at a value of \$5 per thousand. The total value in a season will not, however, exceed about \$125, representing 25,000 oysters. This total of 145,000 oysters in shell, by count, equals about 600 bushels, worth nearly \$2 a bushel in Key West. Unfortunately I have no record of the number of men or boats given employment.

CHARLOTTE HARBOR, LITTLE SARASOTA, ETC.—Northward of Charlotte harbor and Caximbus bay good oysters are to be had in Little Sarasota bay, and are especially recommended. At the mouth of the Manatee river there is an oyster-bar that produces the stock mainly used by the people who live at Braidentown, Manatee, and on the river banks. These are of inferior quality in both shape and taste, but would doubtless be improved by transplanting into purer and salter water. No estimate of the irregular supply from these reefs can be made; it is of small consequence. Mr. Stearns also discovered large single oysters at Palma Sola.

TAMPA AND NORTHWARD.—The town of Tampa and the villages at the head of Tampa bay get their oysters from some famous reefs off Gadsden's point. These oysters are said to be single, and, though not of very large size, to be admirable in flavor. No planting is done in any shape, nor are any oysters sent from here to Key West. I was told that three men and three boats found pretty steady employment in oystering there, and the catch perhaps amounts to a total of 1,500 bushels a year, worth about \$500.

As fast as settlement proceeds on the shores of this low and indented coast, more and more beds of oysters are found available for local use, so that each settlement and nearly every farm, as a rule, has its particular locality or bed. These will multiply, of course, as people and explorations increase, and consequently a demand grows. Thus far, however, no beds have been discovered, bearing an edible sort, in Big Sarasota bay or in Clearwater bay, but that they formerly existed there, and at the lower end undoubtedly exist yet, is shown by the thousands of good-sized specimens mingled with other mollusks in the mounds and shell-heaps at Point Pinellos and elsewhere in this neighborhood.

About the Anclotes (inside), however, and thence, wherever they have been diligently sought for in the mouths of all the rivers and suitable localities, they exist and are used up as far as Crystal river, where is found the first real "fishery", albeit of small proportions.

Between Crystal river and Cedar Keys there is little worth mention in the way of oysters, the Homosassa and Withlacoochee beds sufficing only for local demand, supplemented by the better stock from above and below there.

\*The main consumption of oysters in this reef city consists, according to Mr. F. F. Ainsworth, of canned stock from Baltimore, shipped via New York by steamer. Nearly 25,000 cans (1 and 2 pounds) are reported as used annually, the value of the sales in 1880 approximating \$1,500.

**CEDAR KEYS OYSTERS.**—At Cedar Keys we come upon the first considerable town in our progress up the coast, and the first harbor and railway terminus. It is not surprising to find, therefore, that here the oysters have a commercial value. The banks where they are obtained are on Cragin's bars, which are exposed at low tide, five miles south of the village; and at a still better locality to the northward of the keys that shield the harbor. There are four or five young men here who, in the season, devote themselves mainly to supplying oysters, which are sold to various shippers, and sent to Gainesville, Jacksonville, Fernandina, and lesser towns by rail. During 1880 the railway reports carrying 2,710 barrels, equal to 6,800 bushels, for which, at 65 cents a barrel, or hardly 20 cents a bushel, the catchers were paid \$1,811 50, and the shippers received \$3,387, making the average price about \$1 25 per barrel. In Jacksonville these oysters sell at from 75 cents to \$1 a bushel. If to this 6,800 bushels we add 3,200 bushels for home consumption, the total of 10,000 bushels would probably represent the whole catch at Cedar Keys.

The boats in use by the oystermen here are about 20 feet long and 8 feet wide. They are very roughly built, but well suited to their work. They have center-boards and large sails, are sea-worthy, and in smooth water will make very fair speed.

No attempt at any sort of cultivation has been made here, although it is said that the bivalves are far less plentiful here than formerly. Popular theory ascribes this to the killing effect of cold weather.

The Cedar Keys oysters have a different taste from anything I have experienced elsewhere, and one which will commend itself to those who like a saltish oyster; but there is a flavor about them, in addition to their saltiness, which distinguishes them at once (if those I ate were fair samples) from anything else. On the whole, they must be pronounced *good*; and usually they are of large size.

Here and there oysters exist in edible condition between Cedar Keys and the Suwannee river, and beyond toward Apalachicola, but they only supply the sponge-fishermen and shore-farmers, except at Saint Mark, where several large reefs impede navigation. In respect to these I quote Mr. Stearns' notes, which allege that out of the many of these reefs of worthless oysters, only one or two produce marketable stock, yet these probably fully supply the demand of Tallahassee and the neighboring Georgian towns that get their supplies from here. The beds are about five miles west of the light-house, near Shell point. The oysters are of small size, and four men, with two large fishing-boats (with a sail) are all that work at gathering them, selling about 1,000 bushels, worth \$500, annually. The tongs they use are home-made, and consist of wooden imitations of the stronger, iron-backed tongs commonly seen elsewhere.

**APALACHICOLA.**—Concerning Apalachicola, farther westward, Mr. Stearns also informs me:

This neighborhood has been highly favored with a large number of beds furnishing oysters of large size and fine flavor, which are easily procured and distributed by means of river steamers from Apalachicola, through a wide area inland. Besides a number of large reefs in Saint George and Saint Vincent sounds and Apalachicola bay, there are scattered all through the deeper waters a great many small beds. The depth of water here averages 7 feet, and it is brackish and full of sediment. The oysters from these beds are of superior flavor; I found none better in any part of the Gulf during my visit in 1881.

The reefs, or beds, are only an hour's sail from town; therefore the outfits or preparations for a trip need not be very great. When the tide is high the boat anchors over a bed, on which there is from 5 to 10 feet of water, and both men use tongs to bring up the oysters with. As each tongful comes up, the worthless ones are culled out and the good ones are thrown into the hold. The tongs in use here are made of iron, some galvanized and some not, in the same shape as those used on the Chesapeake. With these tongs, on a spot where the oysters are abundant, and need but little culling, two men can put 50 barrels of good oysters into the hold in one day.

If the tide is very low, as is the case during "northers", the boat is run aground on an oyster-reef, a gangway-plank is placed over the side, and the oysters are picked up by hand and carried aboard in tubs. Oystering in this manner is said to be harder and slower work than tonging them. When the boat is loaded she goes to town, and if there be a steamboat there, the oysters are turned over to the dealer on board of her; if not, they are not delivered until one does come. The oysters sell for 50, 60, and 75 cents per barrel, all ready for shipment, that is, in barrels and covered with gunny sack at the top; but the oystermen seldom get barrels or sacks, which have to be furnished by the dealer, at the rate of 10 cents for sacks and 20 cents for barrels, leaving the oysterman but 20, 30, or 45 cents per barrel for the oysters. It sometimes happens that barrels cannot be bought for any price in Apalachicola, and immense quantities of oysters must either be thrown away or lie over until barrels can be brought from neighboring towns. There are four steamboats running on this river in the winter, two of which carry the mail; but it frequently happens that the mail is not received here for two or three weeks, and large amounts of oysters and fish have to be thrown away in consequence. A few vessel-loads of oysters are taken to Saint Mark during the winter, but it is a trade of not much consequence. The shipping season lasts from November to April.

The boats in use are all small sloops of 20 or 25 feet length, carrying each two men. Last year (1878) there were twenty of these boats engaged in the oyster-fishing. With their outfit of tongs, etc., they are thought to be worth about \$2,500. Between forty and fifty men are engaged in this business, out of which they make but little more than what they spend for food while earning it. If two men who are running a boat have a good contract with the dealer, good wages can easily be made; but if they have no contract they are obliged to cut the prices down in order to sell at all, and also are kept lying at the wharf about half their time. From \$5 to \$8 per week, therefore, is an oysterman's wages when working.

The principal dealer at Apalachicola states, that he and other dealers there shipped up the river, during the winter of 1878-'79, 15,000 barrels. These, at the rate of 30 cents a barrel, yielded to the oystermen \$4,500. In addition, owners of vessels disposed of about 2,000 barrels at Saint Mark at 50 cents a barrel, equal to \$1,000. The total value of the trade that winter, therefore, was \$5,500. It is only within five years that the trade has approached even this amount. Now it is improving, and new markets, such as eastern Florida towns (by steamer and rail), are opening.

**SAINT ANDREW AND CHOCTAWHATCHIE BAYS.**—Saint Andrew bay is the next place where edible oysters are found. Here there are no large rivers, and the water is salt. The oysters lie in beds scattered all over the

upper parts of East, North, and West bays, and are most abundant in the deep and open water. These are the favorites of the Georgian inland towns, where they chiefly find their way.

Choctawhatchie bay, next westward, contains very few oysters, but the large shell-heaps there show that formerly they were taken in vast numbers. Now, the few that are got are found scattered over grassy shoals.

PENSACOLA.—Arriving now at Pensacola, I am again indebted to Mr. Stearns' studies for my facts. The oyster-season there begins in September and ends in April. The banks worked (only with tongs) lie in Escambia bay, and are scattering and very poorly stocked—not so well as formerly. The absence of shell-heaps on the adjacent shores show that the Indians did not resort to this for a supply of molluscan food to any great extent.

The boats serving here are open, flat-bottomed, roughly-made skiffs, not exceeding 24 feet in length, and cat-rigged or sloop-rigged. Two men form the crew, and consider from five to twelve barrels a load, satisfying themselves with one trip per week. As there are about seven boats, an averaged estimate of the season's total production would give about 2,500 bushels. The selling-price being only 35 or 40 cents per bushel, the cash proceeds will hardly exceed \$1,000, to be divided among about fifteen fishermen. A system of sharing is in vogue, by which the proceeds of each day's catch is divided into equal thirds between the boat and each of the two men who constitute her crew.

"The catch at Pensacola," Mr. Stearns says, "often fails to supply the local demand, and additional oysters are obtained from Mobile and Saint Andrew bay. Nothing of consequence has been done here in oyster-culture."

RECAPITULATION FOR FLORIDA.—A résumé for Florida will not be out of place here, and will represent the following facts:

Number of catchers and shippers .....	166
Number of boats engaged .....	110
Value of same .....	\$8,000
Number of bushels sold .....	78,600
Value of same .....	\$15,950

#### 55. OYSTER-INDUSTRIES OF ALABAMA.

THE MOBILE SUPPLY.—Crossing the line into Alabama, the port of Mobile offers opportunity for the sale of many oysters, and more or less cultivation of this food-mollusk is carried on there. I can here, also, supplement my own notes by the records of Mr. Silas Stearns:

"The oysters that are brought to Mobile are obtained from natural and artificial beds in Mobile bay. Those from the natural beds are called 'reefers', which are slightly inferior in size and quality to those from the artificial beds, which are called 'plants'. They are obtained in a portion of the bay called the 'gully'; the only place where they are naturally abundant. The planted oysters are originally obtained from the salt water, near Cat island, between Mobile bay and Biloxi, Mississippi, and are deposited in front of the oysterman's land.

OYSTER-CULTURE.—"The state laws provide that any settler on its bay shores shall have the right to use for oyster-culture the water surface in front of his lands from low-water mark 600 yards outward.

"About thirty vessel-loads, or more than 2,500 bushels, are usually planted at first on new grounds, and are allowed to remain two years before they are gathered up to be sold. The next and following times that deposits are made it is not necessary to plant as many as at first; for there are many small oysters that escape the tongs which will soon grow large enough for market.

"It is calculated that in two years the small salt-water oysters will have so grown in size and so increased in numbers, that there will be about twice as many as when transplanted; but this ratio can hardly be depended upon, for it often has been proved that, to realize an increase of 50 per cent., the location and circumstances must be most favorable.

"Oysters as taken from salt water are in very poor condition, but in an incredibly short time, in fresh or brackish water, they become large and fat. Still there are times, when the bay is almost purely fresh, that certain injurious qualities in it (perhaps from the extensive swamps) either destroy oysters or turn them so red that they are unfit for market. Invertebrate animals are probably the cause of many oysters being killed, though the oystermen seem to be ignorant of it. Drum-fish are also very destructive.

OYSTER-FISHERIES.—"Besides the 'reefers' and 'plants', there is a kind of oyster called here 'sharppers', from the fact that the ends of their shells are unusually sharp. They are a natural-growth oyster of very large size (shells averaging 8 or 10 inches long) and superior flavor, that are found growing separately along the bay shores, not far from the place where 'reefers' are gathered. 'Sharppers' are always in demand, though there is some objection to them on account of their being so hard to open.

"'Reefers' and 'sharppers' are caught by men who follow no other pursuit, and who are a quite distinct class from the oyster-boatmen. They have small, flat-bottomed skiffs of the roughest description, in which they go 'a-tonging', two men occupying a boat and taking turns at tonging and culling. As fast as the stock is culled it is placed in shallow, oblong boxes holding one-fourth of a barrel each, and in these measures is sold to the boatmen or carriers at the rate (during the winter of 1880-'81) of 10 cents a 'box', or 40 cents a barrel. The carriers having

obtained a load for their sail-boats, proceed at once to the city and deliver them to the dealer, by whom they are employed to buy or with whom they have contracts. The measure, in this transaction, is the same box as before, but the price has nearly doubled, holding all last season at 75 cents a barrel. While the gatherers are paid per measure for what they catch, the profits of the boatmen are divided among the crew by a 'lay' arrangement of sharing, by which the crew pay provision bills and receive 60 per cent. of the proceeds. Of the owner's 40 per cent. remaining, the captain gets 10 or 15 per cent. additional. In a few cases the captains own their vessels, and prefer to hire their crew at \$20 or \$25 a month. There are only two or three men in the whole crew of an oyster-boat."

**MOBILE OYSTER-BOATS.**—"They are small, light-draft vessels," says Mr. Stearns, "ranging from 3 to 20 tons in size, and are rigged as schooners or sloops (not much attention being given to the matter) in the common American style. They are arranged so as to have as much deck and hold room as possible for the oysters; therefore, their cabins are small and uncomfortable. From the cabin bulkhead to the mast the space in the hold is uninterrupted, except by the center-board case, and there the load of oysters is carried. It is not often that the deck is heaped with oysters, but the clear, roomy space is useful in culling and handling the oysters as they are received and discharged. These vessels are not graceful or pretty, for their light draft (not more than 2 or 3 feet) and full lines destroy all intentions in that way. They are rather cheaply and roughly built, too, but as they are not intended for or used in rough water, they will last almost as long and earn quite as much money as finer and more costly ones would. Twenty thousand dollars would buy the whole fleet, and another \$20,000 represent all additional capital invested."

**SALE STATISTICS FOR MOBILE.**—Trustworthy statistics of the production of Mobile bay are not available. About 20,000 bushels I estimate as the sales of planted stock, and I consider that 60,000 bushels would cover the whole consumption at Mobile.

This yields the following approximate returns to the respective classes engaged:

40,000 bushels "reefers", at 15 cents a bushel profit, gives catchers.....	\$6,000
40,000 bushels "reefers", at 13 cents a bushel profit, gives carriers .....	5,200
40,000 bushels "reefers", at 15 cents a bushel profit, give shippers .....	6,000

The first value of this 40,000 bushels of "reefers", therefore, is \$6,000; the second, \$11,200; the third, \$17,200; and the retailer probably receives \$25,000 or more in dealing out to consumers. The value of the 20,000 bushels of plants is about \$17,500 to the planter and \$20,000 to the wholesaler. For our purpose we may take the carriers' price, paid by the dealer to the carrier and the planter, as our estimate, and say that the total first value of the 60,000 bushels is \$28,700. The report of the board of trade, that in 1878-'79 business in oysters to the amount of \$95,400, and in 1879-'80 to the amount of \$111,000 was done, no doubt represents sales additional to the strict limits of our inquiry in this matter.

**OYSTER-TRADE OF MOBILE.**—The oyster-dealing, wholesale and retail, and restaurant business in Mobile no doubt supports 100 families, chiefly of colored persons, or at least forms an important part of their annual resources. Many of these are openers, who work by the piece as work offers. Mr. Stearns refers to them in his memoranda as follows:

The oysters, having been deposited in a pile in the dealer's warehouse, are next taken in hand by the "openers", who are placed in a circle around the pile, each with his stool, bucket, and oyster-knife. These men are principally negroes and creoles of the worst character, who find it hard to obtain other employment. Still they are very expert at opening oysters, and often make fair wages. The knives used by them are all of steel, about six inches long, with heavy, flat handles, and wide, thick blades, rounded at the end. To open an oyster it is held in the left hand, lower shell down and lips outward, and the shells are quickly pried open at the hinge, the upper shell being thrust off. One more stroke severs the oyster from the lower shell, and into the bucket it goes, liquor and all. Some kinds of oysters cannot be easily opened in this way, so they are broken first on the lip edge and entered from that side with the knife. The majority of Mobile oyster-openers are very quick while opening either of these ways, but are probably more practiced in the first. The shells are thrown one side in a pile, and the "openers", if left to themselves, will throw away many good, unopened oysters, in order to hasten through their barrel, if they are opening by the barrel, or to get rid of small oysters, if they are opening by the gallon; therefore, it is necessary to have a man employed to watch them and prevent this waste.

When an "opener" has filled his bucket he takes it to a clerk to be emptied into a strainer, when the oysters are measured and placed to his credit.

The customary price paid for opening oysters is 35 cents per barrel, or 20 cents per gallon. At certain times of the year a barrel of oysters in shell will yield more opened oysters than at others; for instance, in the fall hardly two gallons are obtained, while in the winter and spring two to three gallons are taken from one barrel.

As soon as the oysters have been opened, measured, and drained of their liquor, they are emptied into a large vat that has a strainer-like bottom, and are kept cool by means of ice until needed for shipment or canning. To be shipped to any place not far inland, they are usually placed in cans varying from one to ten gallons, according to the order, that are not hermetically sealed, but are kept in contact with ice. To be shipped to more distant parts they are placed in square cans, containing from one quart to one gallon, and are hermetically sealed. This manner is more costly to the purchaser, but is the safer way, for oysters so put up will keep a long time.

Pickling oysters has been of some importance here, but there is very little done at it now. The method of treatment was, first, to steam the oysters, and then to place them in small, square tin cans with spiced vinegar, the cans afterward being soldered up air-tight. It is said that this business failed because of much poorly prepared goods being put on the market. In pleasant weather, when the gatherers can work and the boats can easily get to the city with large loads of oysters, the Mobile market becomes overstocked, and it is then difficult to dispose of the catch at any price; but in stormy and cool weather the market is good, for then but few boat-loads come in, partly owing to real difficulties and partly to the indolent indisposition of the oystermen to work when discomfort attaches to it.

The oysters of Mobile bay have a high reputation for excellence. The water and soil of the bay, particularly in the eastern arm, called Bon Secour, seem especially well adapted to their growth. The planting-beds are all higher up, where the seed thrives better than below.

The foregoing operations give employment for three-fourths of the year to about 175 men, and kept afloat, in 1879, 62 vessels.

STATISTICAL RECAPITULATION FOR ALABAMA:

Number of vessels and sail-boats engaged.....	62
Value of same .....	\$10,000
Number of sailors (also planters) employed .....	250
Annual earnings of same (excluding their own sales) .....	\$10,000
Number of restaurant servants and openers .....	100
Annual earnings of same .....	\$4,000
Annual sales of oysters.....bushels..	104,500
Value of same .....	\$44,950

THE GULF OF MEXICO OYSTER COMPANY.—Early in 1880 a new concern, to be known as the Gulf of Mexico Oyster Company, began oyster-canning and shipping at Mobile, for though their factory was many miles distant, at Scranton, Mississippi, yet the officers were in Mobile, and the business contributed to the city. About 90 to 100 hands, of all ages and sexes, are employed. These live in a little village, which the company has built for the purpose, in the neighborhood of their factory. While this company does something in the fresh-oyster trade, their main business is in cooked and canned oysters, which are steamed and sealed in substantially the same way as at Baltimore. One specialty, however, is the putting up of canned fried oysters, after the following patented method:

From the supply vat, where they are kept cool, the oysters are taken and rolled in meal and fine cracker-dust, and then are dropped, a gallon at a time, into a large kettle of hot fat, which is a mixture of lard, tallow, and stearine, where they are allowed to fry crisp and brown. Next, while still hot, they are packed in small, flat, square tin boxes of about a quart capacity, and the unoccupied space is filled with hot fat. The opening in the top of the box is round, and has a cap to fit, which is firmly soldered down, making the box air-tight. Afterward these boxes are labeled and packed in cases, a dozen boxes in a case. It is asserted that oysters prepared in this manner sell readily in all parts of the country, and the demand is much larger than was at first expected.

The "cove oysters" of this company are simply fresh oysters hermetically sealed in cylindrical cans.

The capital stock of this company is \$25,000. (Another company has recently been projected with a capital stock of \$50,000.) Though the capacity of the Scranton factory is no less than 30,000 one-pound cans per day, the product at the time of my visit had been insignificant, owing to various delays in getting well under way. The company will also can shrimps, fruit, and vegetables in season, so that not all the force, capital, and fixtures can be credited to oysters alone; and, inasmuch as operations have only begun, I have not added these figures to my totals. The stock which they receive for canning is the wild "reefer" oyster, that grows in immense profusion all along the coast of Mississippi.

56. OYSTER-INDUSTRIES OF MISSISSIPPI AND LOUISIANA.

GENERAL CHARACTERISTICS OF THE OYSTER-FISHERIES OF MISSISSIPPI.—On the coast of Mississippi there are several small villages, more like watering-places than anything else, that do some business with fish and oysters. The latter trade is of the most importance, for there are one or two firms in each place engaged in it, while there is but one man on the coast who makes a business of shipping fish. The Mobile and New Orleans fishermen and oystermen are fishing or oystering in the neighborhood at all times, and these, together with unprofessionals who are striving to furnish their home tables, make quite a show, giving one an idea that the fish-and oyster-business must be very important at these towns. A great many of the New Orleans boats also land their catch at these points to be shipped by rail to their home-ports.

THE MISSISSIPPI OYSTER-FLEET.—The number of oyster-vessels belonging in the state is given by Mr. Stearns as 18, worth \$3,600, to which can be added \$700 worth of oyster-sheds and tools. There are seven dealers in the state also, whose sales for 1879 were reported at 18,920 gallons. At the average price of 35 cents a gallon this would amount to \$6,622. If these figures seem too low, it must be noted that they apparently do not include the shipments in shell by express to interior towns, which from Biloxi, at least, and also from Mississippi City, Pass Christian, and Bay Saint Louis, are considerable. It would be safe, probably, in point of value, to add to the \$6,622 enough to make an even \$10,000, as an estimate of the annual yield of the coast of Mississippi, separate from the catches of the Mobile and New Orleans boats in her waters, and of the sales of her own oystermen, who take their cargoes by boat to those cities.

**THE OYSTER-TRADE OF NEW ORLEANS.**—At the southern metropolis, New Orleans, centers the most extensive oyster-trade of the Gulf of Mexico, and some of the stock sold in that city is of very high quality. There is no locality in the whole United States where the business presents so many picturesque features, and the oyster-landing at the levee is one of the most spirited and entertaining sights of the many half-foreign pictures to be got in that polyglot city.

My report upon the oyster-business here is made up of information communicated to me by Mr. Silas Stearns, of the Census Office, by Mr. F. F. Ainsworth, and out of my own investigations; but the necessity for my early departure for duties in Washington, prevented my staying as long in Louisiana, or working as thoroughly in that field, as I wished to do.

**SOURCES OF SUPPLY.**—The New Orleans market is supplied with oysters from an extent of coast comprising the whole water-front of both Mississippi and Louisiana, and embracing numerous tonging-grounds. The great majority are taken from the natural and luxurious growth of the "reefs", but the transplanting and consequent improvement of oysters is being more and more engaged in. The delta of the Mississippi river forms a partition between the two classes of oysters and oyster-localities tributary to New Orleans—a distinction which is perpetuated in the city markets. The first of these divisions to be considered, is that which lies eastward of the delta, extending from Lake Borgne, Point a la Hache, and the Chandaleur islands to Pascagoula and the end of Mississippi sound. Though the Chandaleur islands, and some other points, produce an oyster of good reputation, the general quality and size of the stock from this eastward portion is inferior to that from the western district. They are used for cooking chiefly, and it is this stock which is being bought by the canning companies lately started in the city. The best grounds seem to be the Chandaleur islands, Bayou Muscle, Bayou Boulfen near Mobile, and the shell-bank outside of Biloxi. "The Bayou Muscle oyster is peculiar. It is large, very black, and the shells are covered with hair and barnacles. The Boulfens are round, rich, and fat, and sell very high." The *Picayune* stated that 30 boats came to the city from Biloxi and along the sound, in the winter of 1879-'80, but this seems to have understated the case, for our careful inquiries registered 50 boats of five tons and upward, and 200 boats of less than five tons, as trading along the eastern coast; many of these, however, are otherwise engaged during a portion of the year. The boats are generally small, rarely having more than two men, and will be more fully described hereafter.

Turning to the district west of the delta, we find that oysters are procured from all the marshes and bayous, nearly as far as Galveston, Texas. The *Picayune*, in an article during the winter 1878-'79, gives a fair account of this source of supply, as follows:

This portion of our state seems best suited to the propagation of the best, and Bayou Chalons, Four Bayous, and Fontenelle are known only for their oysters. Yesterday a representative of the *Picayune*, in order to place before its readers something more definite than the confused ideas generally prevailing about our oysters, visited a number of veterans in the trade. Even among them there is still some confusion regarding the merits of certain oysters, but what was agreed upon by all was taken as the basis of what we give.

There are engaged in the business of supplying the city about 120 luggers, with a carrying capacity each of 75 to 100 barrels. From Barataria, which comprises Bayou Cook, Chalons, and Four Bayous, there are eight, making at least one trip a week. From the Southwest pass, Salina, or the Salt Works below Fort Jackson, about 30 boats. From Timbalier, including Bayou Cyprian, Fontenelle, and Lake Peliot, about 15. These vessels, and the labor at the fishing banks, give employment to over 4,500 men. \* \* \* There has been a general impression here that Bayou Cook furnishes our best oysters, but that little water course has long since given up its natural supply, and those that are now received from there are only a few that are planted.

Our best oysters come from Bayou Chalons, Four Bayous, Bayous Fontenelle and Cyprian, and a small supply from Lake Peliot. These rank the highest and are called the first-class. The Bayou Chalons oyster is a large, long oyster, with a clean shell; the Four Bayous are middling, round, and firm; the Bayous Fontenelle and Cyprian are small, hard, and round, and much preferred by connoisseurs. The Lake Peliot is a round oyster, very fat and salt, and on account of the hardness of its eye preferred for frying. The second-class oysters are the Timbaliers, where they are taken from the reef, not the one planted in the bay. They are in bunches and are long. In the same class are the Salinas, or those taken at the Salt Works near Fort Jackson. They are what are called the "summer", and by restaurateurs the "kitchen" oyster. They cook well, but are not as rich in flavor as those of the first-class. At the Southwest pass, proper, all the bivalves are dead now, but near there, at East bay, they have a very good kind, with a light-colored shell and very white inside. Then there are the Grand Lakes, from the vicinity of Fort Livingston, near Grand Terre. Although the supply is not very great there is always a demand for them, as they have a peculiar flavor.

The number of boats bringing and catching oysters in this region is counted at 205, of which 40 are of over five tons burden. Their business is mainly done during the winter, and in summer they are largely engaged in transporting fruit from the coast-plantations to the city, though some "lie up" for repairs.

**LOUISIANA OYSTER-BOATS.**—These Louisiana oyster-vessels are all of one class and are known, from their Mediterranean rig, as "luggers". They are in model much like the common light-draft American center-board sloops, and vary in size from 16 to 40 feet in length, the largest measuring about eight tons. Mr. Silas Stearns has described them in detail, as follows:

They are decked over forward and aft, and for a foot or eighteen inches on each side, leaving the central part of the boat open and unobstructed for freight. Hatches are usually provided to cover the undecked part from the weather. The oyster, fruit, and vegetable boats of this class have a clear hold and stow their freights from one to the other, in bulk, but the fish-carrying luggers have zinc-lined ice-boxes on each side of the center-board case, which are of the most simple arrangement, and are reached through trap-door covers, after the outside hatches have been removed. When the boats are loaded the crew sleep on deck, protected by an awning.

As to rig, they have one tall mast, placed in about the same position as a sloop's, a long yard, and a huge, nearly square, sail. When in use the sail is hoisted and stretched by the yard, and the two lower corners are secured at bow and stern by sheets, which are arranged with travelers to work across the deck. The yard is so slung to the mast that about one-third is on one side and two-thirds on the other, and the spread of canvas is so situated.

The yard is hoisted by one halliard, besides which there is very little gear of any kind. To sail close to the wind, both forward and aft sheets are hauled tight, which brings the yard and canvas nearly parallel to the boat, and also draws down the forward and short end of the yard, giving the after-part of the sail some "peak". To sail before the wind, both sheets are slacked until the yard and sail swings square. Boats rigged in this way are said to be very fast sailers, and do far better than sloops or schooners in beating to windward. Considerable skill and practice is called for in their management, since the long, heavy yard is troublesome at times, and makes the danger of a capsizes very great.

These boats are built at New Orleans and other points near by, in most cases by their owners. The average cost of one measuring six tons is about \$800, and has been nearly double that amount until within the last three years.

A large fleet of these boats gathers at New Orleans, the majority of which are engaged in carrying fruit, vegetables, and other country produce. As the oyster-season does not extend over the whole year, boats that carry oysters in that season are engaged in other work out of it. It also happens that boats engaged in the oyster-fishery one season are quite likely to be otherwise employed the next. Considering this, I place the number of boats at present engaged in oystering for the New Orleans market at 43, employing 129 men.

In respect to this same matter Mr. Ainsworth writes :

The peculiar lugger-rig of the boats (only one sail with no jib or bowsprit), the many rows of reef points, most of the sails being fitted to reef down five times, enables them to work very close to the wind. As a rule, the sailors prefer a beam-wind or one on the quarter; they cannot work well with an after-wind. On return trips up the river, the ease and quickness with which they can be handled render the luggers independent of the tug-boats, and it is only when they are in great haste to get first to market, because of a scarcity of oysters in town, that they accept the help of steam.

THE OYSTERMEN OF MISSISSIPPI AND LOUISIANA.—In going to the lower coast, writes Mr. Ainsworth, the luggers run down the Mississippi generally for about 60 miles, and then through smaller outlets and bayous into Grand Lake bayou and the various grounds on the coast. The men who are employed in this fishery, and also the sailors who own the luggers, are almost altogether Italians and Sicilians, generally of a low order. Their swarthy faces, long, curly hair, unfamiliar speech, and barbaric love of bright colors in their clothing and about their boats, give a perfectly foreign air to the markets. There is not an American style of rig seen, nor hardly a word of English spoken, in the whole gayly-painted oyster-fleet of Louisiana.

Most of the oysters brought to New Orleans are from naturally growing, uncultivated reefs, with which the whole coast is barricaded, and to which, in a large measure, it owes its preservation from the teeth of the ocean. These reefs are ridges of oysters, packed one above another, each generation supported on the compact and dead shells of the preceding. In general the oysters are found not singly but in great clusters, some of which are half as large as a barrel. When gathered in this shape there is a great waste of young oysters, for those that are attached to the large ones are not separated until after the boat has left the grounds or is at town, when they are thrown away as useless. At certain stages of low water such oysters as these can be picked up by hand. In other places, ordinarily in the open bays, oysters are found in a more scattering condition, but are more readily gathered and require less culling. In most cases they are procured with oyster-tongs from the lugger, as she lies at anchor over the bed. One man uses the tongs while the other culls them; or, if there are three in the crew, two use tongs and the third culls for both.

This is the method with all the smaller boats which tong their own cargoes. They have to go far from home, and often the men do not get home once a week, or even every two weeks, and must lie exposed to many hard storms, both when at the reefs and in going back and forth the 40, 60, or 100 miles to market. The owners of the larger vessels, however, generally buy their cargoes direct of men who live in the vicinity of the reefs, and by making more trips, having fleet vessels, can in a season make considerable money. In the summer time, those who have been prosperous sometimes take their vessels down the river about 65 miles, and pass through tortuous channels into Mississippi sound, and lay up for the summer season in the vicinity of Biloxi, Alabama.

There is a "lay" system in vogue in many of these boats for the distribution of profits, by which the boat and each man receives an equal share, after the bills are paid.

OYSTER-CULTURE.—Oyster-planting amounts to very little along the coast now under view, and what is done is of the simplest character. I can form little notion of its extent or the number of planters. The reef-oysters are taken from the natural beds by tongs in June and carried up the half-fresh bayous, or inshore, where they are laid out between tides until time to sell them in the fall. This improves them somewhat, but seems to be chiefly serviceable in making them more readily accessible for market, and so saving time. The *Picayune* said that in 1878, 4,500 men were employed in making and assisting in making such transplantings.

OYSTER-MARTS IN NEW ORLEANS.—There are three separate landing places and marts for oyster-boats in New Orleans: the Old Basin, the New Basin, and the French market levee.

To the Old and New Basins (chiefly the former), in the rear of the city, reached by canals from Lake Pontchartrain, come the boats from the eastward, bringing "lake" and "reef" oysters, generally of inferior quality, and intended to be sold to the canning establishments, or to be opened for cooking purposes. The boats average smaller than those used in the river westward, and usually carry only two men. The price of the oysters—frequently measured out in quarter-barrel boxes similar to those in use in Mobile—depends upon the state of the market as governed by the supplies received from the West, and often goes down to 50 or 60 cents a barrel, at which price there is no profit, and the oystermen stop running until a rise occurs. The average price, however, is said to have been \$1 50 per barrel last winter; and 65,000 barrels is said to have been the total of receipts on this side of the city. This would equal about 170,000 bushels, at 39 cents a bushel. The men who bring oysters from the eastward

say they must have higher prices than formerly, on account of the growing scarcity of oysters, and the longer time it takes to get their load. Many more are oystering now than before the war.

At the levee opposite, or just below the famous old French market, is the other and greatest oyster landing-place, mustering about 205 boats, with 615 men or more in the crews, and the picturesque scene I have heretofore described. The estimate of annual receipts there at present gives 50,000 barrels, or 125,000 bushels, commonly sold at \$2 to \$3 50 per barrel. All of these come from westward of the delta, and being larger and finer are, as a rule, bought by the saloons and restaurants, and served to their customers on the shell.

**WHARFMEN ON THE LEVEE.**—A peculiar feature of the business on the levee, consists of an organization of wharfmen, who form a species of close-corporation to do the work of carrying the oysters from the boats to the wagon of the purchaser, who pays them 15 cents a barrel for the service. The boatman having sold his cargo, he then has no further concern; his boat being taken in charge by the carrier, who might be called a 'longshore man, and who delivers all the oysters and sweeps the vessel and puts her in proper condition for the crew. While there is no society of these carriers, strictly speaking, they manage to make their business a close-corporation, since no one is allowed to discharge a cargo of any kind from the luggers—oysters, oranges, or fruit—except one of the members of the body. There is a man who is called the foreman, who receives all the money for the carriers and who divides the proceeds equally among the different carriers, but just how this is regulated, as well as many other of the details of this quasi-organization, is kept as mysteriously secret as possible. The body is an old one and now consists of about 50 men in all, mostly Sicilians and low-grade Italians, and, as near as I can judge, the annual receipts for the carriers amount to about \$35,000, levied on the oysters, oranges, melons, and various fruits. Some years ago the city designated a man to act as foreman, and he held the post for twenty-two years, not giving it up until his death, when he was succeeded by his son, who now has the place. The system is beginning to be felt as an unwarranted incubus on the trade, and a monopoly which should be opposed. In consequence it doubtless will soon be broken up, and each purchaser will land his own oysters, or the boatmen deliver them to the wagons at less cost than now. The levees are leased by the city to a firm, who collect \$20 a year wharfage from the luggers.

**SHIPMENTS OF OYSTERS FROM NEW ORLEANS.**—The shipment of oysters inland from New Orleans has hitherto been of very small account, and principally of fresh oysters. Now, however, at least two canning establishments have been started in the city, which make a large item in their general preserving business of cooked and hermetically sealed oysters, prepared substantially as in Baltimore. Several brands have been put upon the market with good satisfaction, selling at \$2 50 per dozen two-pound cans for first quality, and \$1 80 for second, and at \$1 10 for one-pound cans. About \$100,000 worth of these canned oysters are said to have been put up during 1880, nearly all of which were taken by the trade of the city and immediate neighborhood. The capital invested is, perhaps, \$75,000, but is applied to shrimp-, lobster-, and fruit-canning as well as oysters. In these establishments only about 30 male adults are employed, the openers being girls, about 100 in number, all white and chiefly German and American in nationality, who are paid from 4 to 6 cents for each kettleful, a "kettle" holding two quarts. Work is irregular, because of the difficulty of getting oysters in sufficient quantity and when needed (owing mainly to the indisposition of the oystermen to work in bad weather), and the total earnings of the openers and employes during the "oyster-run" in the factories, will probably not exceed \$20,000. These factories have not been long enough in progress to furnish more exact information than is here given. Their capacity is far in advance of their present product, and they anticipate a highly successful future, confident that they can secure the trade of the lower Mississippi valley, to the exclusion of oysters canned in northern cities.

**STATISTICS FOR NEW ORLEANS.**—In summary, we have the following statistics for New Orleans:

Total number of boats employed .....	165
Value of same .....	\$13, 750
Value of shore-property and tools, about .....	\$23, 000
Total number of oystermen .....	1, 300
Number of shoresmen .....	100
Annual product, about .....	bushels.. 295, 000
Value of same, about .....	\$200, 000
Average price per bushel, about .....	\$0 70
Number of carriers .....	50

## 57. OYSTER-INDUSTRY OF TEXAS.

**RECEIPTS AT GALVESTON.**—At Galveston, Texas, the receipts of oysters are composed in the main of small, medium-flavored stock, obtained in Galveston bay and brought to the city in small boats. Mr. F. F. Ainsworth writes me, also:

A considerable number are received by steamers, being brought in sacks from points to the west of Galveston, such as Indianola and Corpus Christi. A few are brought also from Morgan City and points on the Louisiana coast, these last being very fine and of good flavor, bringing rather better prices.

PLANTING AT GALVESTON.—Formerly, at Galveston, it was the custom during the summer to plant oysters from the reefs in the numerous bayous, where they would fatten. This branch of oyster-industry was nearly killed by the recent passage of a state-law prohibiting the gathering of oysters during the summer, from May 1 to September 1. The oysters in October, and even until January, are for the most part poor and with little flavor, so that it is not until February and March that they are really fine. The greater part of the receipts are sent inland.

THE OYSTER-BUSINESS OF GALVESTON BAY.—Concerning the business of Galveston bay, Mr. Ainsworth reports that the boats used are smaller than the New Orleans luggers, the largest being of only about 40 barrels' capacity, and the average 18 barrels. Their average value is \$90. They make about 25 trips each between October and April, and carry two men. These and other facts contributed by Mr. Ainsworth appear as follows:

Number of boats .....	70
Value .....	\$6,750
Men employed as sailors .....	140
Men employed on shore .....	100
Receipts of oysters from bay .....	bushels.. 85,000
Value .....	\$45,500
Receipts from Louisiana .....	bushels.. 625
Value .....	\$450
Receipts by steamer .....	bushels.. 2,500
Value .....	\$1,800
Total receipts .....	bushels.. 95,625
Value .....	\$47,750
Average value per bushel (nearly) .....	\$0 50

## S. THE PACIFIC COAST.

### 58. OYSTER-INDUSTRIES OF CALIFORNIA.

SOURCES OF INFORMATION.—The writer was not allowed time from his other investigations to visit the Pacific coast of the United States. He must, therefore, rely for an account of the oyster-industries there, upon what he has been able to gather through the reports of the special agents of the Fish Commission and Census, Messrs. Jordan, Gilbert, and Lockington; from correspondence, and from conversation with gentlemen who are engaged in business at San Francisco, or are otherwise familiar with the matters upon which information was sought. Under these circumstances, the indulgence of the critical reader is sought, should errors find their way into this chapter.

PACIFIC OYSTERS AND THEIR EARLY UTILIZATION.—The oysters of the Pacific coast of the United States, as might be expected, are of different species from those common in our Atlantic waters. Instead of the large *Ostrea virginiana*, we find in California the little *Ostrea conchophila* (of which "varieties" *rufoides* and *expansa* are recognized by conchologists), and the more northern *Ostrea lurida*, commonly known as the Shoalwater bay oyster.

When the settlement of California first began, the oysters growing in San Francisco bay were used, but were considered of small consequence. In March of 1850 was discovered a new locality for oysters at Shoalwater bay, on the coast of Washington territory, just north of the mouth of the Columbia river. Though not as good as eastern oysters, these were better than the very small ones of California, and began at once to be brought to San Francisco. From a newspaper of that date, it appears that of Shoalwater bay oysters there were taken to San Francisco 2,000 baskets in 1850, 1,700 baskets in 1851, and 21,052 baskets in 1853. These went by sailing-vessels. The business then became well organized and highly productive at that point, and the towns of Oysterville and Bruceport rose out of it, where from two to three hundred men had steady employment. The census of 1860 gives the value of oysters in Washington territory at \$44,597. Besides San Francisco, Portland, Oregon, and numerous small ports and inland villages were supplied.

OYSTER-PLANTING IN SHOALWATER BAY.—The Shoalwater bay oysters were planted at home to some extent—that is, they were raked off the natural beds and allowed to lie a few months on staked-out beds nearer shore; but they were also brought to San Francisco in their wild condition and replanted there, supplanting the local stock. A variety of accidents occurred, however, to interfere with the success of these undertakings. In 1862, it is reported that a freshet on the Sacramento and San Joaquin brought in so much fresh water and mud that all the oysters died. In 1867 a blight seemed to come upon the bay oysters, and they nearly all shriveled up as though cooked. Next year came the great earthquake of 1868, and the death of the oysters was attributed to the consequent heating of the bottom. Earthquake shocks have killed the western oysters, and left the thicker shelled eastern stock unhurt. Since that time the northern "plants" have been poor when they came, and have to fatten, as previously they had done. Now they grow steadily poorer. In the face of this they had to contend with the recultivation of San Francisco oysters, with newly-found plants of large size from Yaquina bay and from Puget's sound, and, worst of all, with the importation of oysters from New York, which was begun when the Pacific railways gave a through line across the continent.

The lack of quality of the Shoalwater bay oysters was not only noticeable in those sent to California, but became sadly apparent at home, and the local business began to decline. In 1874, before these effects had made much progress, it was stated in the *San Francisco Bulletin*, "that not much less than half a million of dollars is invested in working the beds and gathering the oysters at this point and in bringing them in schooners to San Francisco. The four companies interested in these beds imported 125,000 sacks last year, at a wholesale cost of \$20 a barrel. About 150 men are employed in gathering the oysters at Shoalwater bay, and perhaps as many more in working the beds and on the vessels". Each sack contained nearly two bushels, so that 200,000 bushels would not be an overestimate. To bring these, required fifty trips of schooners, carrying 4,000 bushels each—an important item of coast commerce. Now, I am told, the Shoalwater bay oyster-beds have largely ceased to be productive, and such oysters as are got are of poor size and flavor. In place of the large exports of half a dozen years ago, there are now produced less than 15,000 bushels, and the price paid to the planters is only from 50 to 75 cents. All that are brought to the metropolis come by steamer, at the rate of about 100 sacks a week for half the year. What is the cause of this sudden and excessive decay of the Shoalwater oyster-beds, no one can say. Of that stock which is planted three-fourths now dies.

SHIPMENTS FROM THE ATLANTIC COAST: HISTORY.—Upon the completion of the transcontinental railways an important epoch began in the history of the California oyster-business, by the introduction of living oysters from the Atlantic coast. Whether this was at the instigation of Californian or eastern men, I am unable to determine, further than that I was told in New York that it originated through A. Booth & Co., of Baltimore and Chicago, who own extensive salmon-canning houses on the west coast. In the *San Francisco Bulletin* for April 14, 1871, I find the following:

Some months ago the *Bulletin* published the particulars of an experiment made to grow a better kind of oysters in the bay of San Francisco, than the native breeds of this coast. Mark Winant and son brought young New York oysters across the continent by rail, transplanted them somewhere on the Alameda side of our bay, and after a year found that they had increased wonderfully in size, while retaining to the full the delicacy and richness for which the New York bivalves are famous. A company styled the Pacific Oyster Company was then formed, with a capital of \$20,000, for the purpose of going into the business permanently, on a small scale. \* \* \* There is no doubt that the business of growing oysters in our bay will become one of great importance, and there is cause for congratulation in the fact. The native oysters obtained along the coast, except the few brought at great expense from Mexico, are small in size, coppery in flavor, and relatively scarce and dear. The addition to our markets of an article equal to the eastern breeds, will be a fact of much value to our *menage* and our commerce.

These first shipments were only experimental, at any rate, for it was needed to know whether the Atlantic "seed" would grow inside the Golden Gate, whether it retains its natural flavor or acquires a bad one, and whether it could be sold at a profit at the close of the process. It was not until 1875, therefore, that any San Franciscan dealers felt justified in ordering large quantities, but in that year large shipments began, which have been continued with regularity and slowly increasing amount ever since, until now something like \$500,000 worth (adding freight to first cost) are annually transported across the breadth of the American continent—an almost unexampled movement of living food. The shipping season is from the middle of October until the middle of November, and again from March 15 to the middle of May. In the spring the cost in New York is a little higher than in the fall, but the average at present is about \$3 a barrel.

PRESENT METHODS OF SHIPPING FROM THE EAST.—The oysters sent to California are all procured from beds in the neighborhood of New York, and are sent exclusively by the firm of J. & J. W. Ellsworth, by whose kindness and permission I am able to present the exact figures appended.

The oysters sent are of two classes: first, those of marketable size and designed for immediate use; and second, those intended to be planted.

For the first purpose stock is selected from York bay, Blue Point, Staten Island sound, Rockaway, Norwalk, and occasionally from Virginia, and from Egg Harbor and Maurice cove, New Jersey; but the whole amount of this class constitutes less than one-fifth of the total shipment. These oysters are either placed on sale at once in the California markets, or are "bedded down" for a few days, to await a favorable sale.

The class of oysters sent as "seed" is entirely different, and is derived chiefly from Newark bay and the North river, stock from there standing the journey better than the East river oysters, which otherwise seem preferable. Beside these is sent seed from Raritan river, New Jersey, and Prince's bay, Staten Island. This seed is so small that a barrel holds from 3,000 to 5,000; this number, of course, includes even the "blisters", or oysters so young that you cannot easily detect the double character of the shell, which looks like your finger-nail. Although the average time of passage is only eighteen days by the fast-freight lines, it is expected that about one-fourth of each barrelfull will prove dead or too weak to survive transplanting at the end of the journey. The "blisters" will be found to have died far more frequently than the larger oysters, none of which, however, are older than a few months and larger than a silver quarter. The cars in which they are carried are double-walled, so as to preserve an equality of temperature, so far as possible, and 22,000 pounds is the limit of the cargo allowed by the company. The freight charges at present are about \$10 a barrel. This makes it unprofitable to import any seed except that which is very small, and which by growth can add very greatly to their size and consequent value.

**PLANTING BEDS IN SAN FRANCISCO BAY.**—The planting beds are situated in various parts of the bay, and nearly all go dry at low water. Some of the localities mentioned are: Millbrae, Saucelito, Alameda creek, Tomales bay, Belmont, Oakland creek, and San Leandro. Sheep island, I believe, is no longer planted. The state owns the bottom and sells it by auction to the highest bidder, the purchaser being given a patent title in perpetuity. The state's nominal price was \$1 25 an acre, but most of the suitable ground was taken up long ago, and must now be bought at second-hand. Portions of it have been sold thus for \$100 an acre. The growth is extremely rapid—fully three times as rapid as ordinarily takes place in eastern waters—and this growth tends toward the fattening of the flesh rather than to greater weight of shell, a result highly desirable; but the mollusk is not considered so hardy here as at the East. The seed remains on the beds from two to four years before selling.

**PRACTICAL FAILURE OF EASTERN PLANTS.**—From the very first, however, it was noticed that all attempts to make them spawn and propagate beds of the eastern species in San Francisco bay, were frustrated by the death of the intended parents. The state of the case was well described in the *Bulletin*:

Every effort to breed the eastern oyster in San Francisco bay has resulted in signal failure. The grown oyster begins to fatten as soon as it is laid down, and this process goes on very rapidly for about six months, when the oyster suddenly dies, apparently of plethora. The young oyster, or the oyster-plant, as it is called, develops quite as well as on the beds from which it was taken, and in due course attains its growth and a fatness and exquisite flavor not possessed by its brother at home. But the experience of the dealers, which is confirmed by observations taken under the auspices of the Academy of Sciences, is that these oysters *will not spawn in this bay*. The most careful investigation has failed to detect any indications of spat on the adult oyster; and the reason is plain enough. It is an axiom of oyster-culture, as we have already pointed out, that oysters breed in salt water on a clean bottom, while they fatten in brackish water on a muddy or marly bottom. *Fattening oysters do not breed where there is much mud.* Now, the two great rivers which empty into San Francisco bay bring down a vast amount of muddy deposit, which forms a layer over very nearly the whole bottom of the bay. This deposit is fatal to the breeding of the large oyster, though it is most conducive to fattening. At the same time the fresh water of these rivers is very detrimental to the breeding process. The mud-flats at Oakland were experimented upon for four or five years, but entirely without success. The same was the result of experiments made at Vallejo. All efforts to breed the eastern oyster on this coast have now been abandoned, and the companies devote their attention to transplanting for fattening purposes.

While the facts above given are true in a commercial way, whatever may be thought of the explanation, it is equally true, however, that a few young eastern oysters are now and then found. The excessive fatness is no doubt due to the thick nutritiously muddy water of the bay, but I should say that this had only a secondary effect on the spawning, which was repressed first by the shock of the long railway journey, and secondly by the unnatural coldness of the water to which they are transplanted. It is a parallel fact to the failure to spawn, in the case of southern oysters carried to northern waters on the Atlantic coast. The summer temperature of the water at San Francisco is much lower than that of the water around New York, although the mean winter temperature may be higher. It is said, however, that considerable eastern spat caught and grew on beds of native oysters near San Leandro last year. I am not sure of the truth of this.

**PRICES OF EASTERN OYSTERS IN SAN FRANCISCO RETAIL TRADE.**—The price of eastern oysters in San Francisco at first was \$15 a hundred; now they have come down to \$2 50, \$2, and \$1 to \$1 50 a hundred, according to grade. "The shoal-water bays," writes Jordan, "sell at about \$2 50 per sack of a thousand. The Olympia oysters sell at about \$2 50 per sack of the same size, but, being smaller, there are 1,400 or 1,500 in a sack. In 1876-'77 they were about \$4 per sack; in 1870-'71, and '72, \$5 to \$6. Previously they had been as high as \$16 per sack. This business, like almost every other in California, has been overdone. More oysters are now planted than can be readily sold, and the sharp competition keeps the prices low, and the sales are disproportionately small for the amount of capital invested. Oysters are a luxury, and with the hard times now in California, luxuries have to be lopped off. The retail dealers refuse to reduce their prices proportionally, and the people go without oysters. The reduction in prices made by the wholesale dealers increases the consumption but little, as the retail dealers and restaurant keepers do not follow. There are now enough oysters planted to supply the whole coast for some time to come. The half a dozen dealers in San Francisco are ambitious for a large business, and it takes but very little of anything to overfill the Pacific coast market. There is scarcely anything in the line of food which can be profitably exported in case of oversupply. The ruling wholesale price for eastern oysters is now \$15 to \$25 or \$30 per thousand, and the whole business is stagnant. No oysters are canned on the Pacific coast in any amount. All are shipped alive in the shell, and little is done except in winter."

**MEN AND CAPITAL.**—The number of men supported in San Francisco and on the bay by the wholesale oyster-trade is about 75 during the whole year, with an additional force in the busiest season. About half of these are married, so that we may estimate from 200 to 250 as the number of persons dependent upon this wholesale trade and production there. Only four firms, all in the market on California street, handle eastern oysters. There are two other wholesale dealers, but their business is in "Shoalwater", "Yaquina", "Natard Bay", and "Olympia" oysters, to the extent of only \$20,000 or \$25,000 a year combined.

The data furnished by Mr. Jordan give an estimate of \$570,000 capital invested by these six firms; total sales of \$900,000, and amount of oysters sold (by count) at 45,000,000. It seems to me that this last item is much too high. I cannot find warrant for sales exceeding half that, or at the very most 25,000,000 oysters of all kinds, equal at most to only 125,000 bushels; and at an average price of \$23 a thousand, this would yield as the total value of cash sales only \$575,000. It is probable an even half-million would cover it.

## THE FISHERIES OF THE UNITED STATES.

STATISTICS OF SHIPMENT FROM NEW YORK, 1874-'80.—A tabulated statement of the oysters shipped from New York to San Francisco between 1874 and 1880, inclusive, is given herewith:

Statement of oysters shipped from New York to San Francisco since 1874.

Kind of oysters.	1875.	1876.	1877.	1878.	1879.	1880.	Total of each.	Purpose.
York Bays.....barrels.	059			177	01	145	1,042	Market.
Newark Bays.....do.	13,064	2,063	2,094	2,015	143	3,701	23,680	Planting.
Raritan Rivers.....do.	1,212	105	122	26		425	1,690	Planting.
North Rivers.....do.	578	838	1,123	206	707	18	3,025	Planting.
Natural Growth.....do.	248	171					419	Planting.
Blue Points.....do.	5	8			2		10	Market.
Sounds.....do.	1,182	584	187	290	1,295	92	3,530	Market.
Maurice Rivers.....do.	133						133	Market.
Virginias, etc.....do.	83		15	3			101	Market.
East Rivers.....do.		1,289	1,871	2,910	878	848	7,790	Half planting, half market.
Princes Bays.....do.		16					16	Planting.
Rockaways.....do.					1		1	Market.
Egg Harbors.....do.					126		126	Market.
Total annual shipment.....do.	17,109	4,500	5,362	6,287	3,213	5,229	41,769	
Total shipment in car-loads.....do.	78	50	00	72	39	03	362	

OYSTERS SOUTH OF SAN FRANCISCO.—To the southward of San Francisco bay no oysters of sufficient size and flavor to have commercial importance occur, except in the bay at San Diego, where Mr. Jordan notes that near La Punta, at the south end, some are got for use. These are of small size and "coppery" taste, however. Eastern oysters have been tried there, but seem not to have succeeded.

MEXICAN OYSTERS IN CALIFORNIA.—Concerning another proposition, namely, the introduction of Mexican oysters, much was said a few years ago. I am not informed as to the practical outcome, but judge it to have been of little or no account, since Mr. Jordan's notes contain no allusion to the matter. It will be well to review the newspaper discussion, nevertheless. In a copy of the *Bulletin*, about March, 1875, I find the following facts:

As long ago as 1850 Dr. Johnson, now a resident of Sinaloa, tried the experiment, but although his vessel had a short passage, few of the oysters reached this port alive. Captain William Randall, formerly master of several vessels plying between San Francisco and Guaymas, made several attempts in the same direction, but without success. The oysters, however, frequently remained alive from fifteen to twenty days. When the steamers first began to run between this port and the Gulf of California, hardly a trip passed without some futile attempt being made to bring Mexican oysters here alive. But the first systematic attempt at importation was made by a company which sank \$16,000 in the enterprise, without any return. [The *Alta California* credits this to a Captain Scoofay.] Tanks holding about one ton each of oysters were placed on the deck of the steamer, and refilled with pure salt water twice every twenty-four hours. The oysters were taken on board at Guaymas; thence across the Gulf of California until Cape Saint Lucas was reached, the sea was smooth and there was no violent motion of the water in the tanks. The oysters remained in good condition, and were observed to be feeding whenever the tanks were replenished. Just after the vessel passed Cape Saint Lucas the tanks were refilled. But now the vessel encountered a head sea, and the water in the tanks was continually swashing back and forth. It soon became foul, and the result was that few oysters arrived alive in San Francisco, and these were in a condition hardly fit for consumption. The enterprise was abandoned after a heavy loss to the projectors.

Many people will remember the circumstances under which C. J. Janson's oyster-expedition came to an untimely end. The steamer *Forward*, which he fitted out and sent down to Mexico, was taken possession of by a party of revolutionists, and was afterward captured and destroyed by the United States steamer *Mojican*, as a pirate. Emerson Corville, the well-known oyster-dealer of this city, organized the latest Mexican expedition. His plan was to ship the oysters from Point Altata to Cape Saint Lucas, from which point they were to be transported by steamer to San Francisco. Both the *Holladay* line of gulf steamers and the Pacific Mail Company's steamers were running at that time. Mr. Corville's agent encountered the greatest difficulties on account of the revolution then going on in the country. It was only after several months that he succeeded in getting a few oysters across the Gulf to Cape Saint Lucas by an eight days' voyage. But the heat of a broiling sun pouring down upon the deck of the vessel, had killed nearly all of the bivalves. Those that were saved were laid down in this bay, where they fattened very rapidly. Had the agent had a vessel at his own disposition, flying the American flag, the enterprise might very likely have succeeded.

The feasibility of breeding the Mexican oyster in San Diego bay, and also in several other of the bays, estuaries, and lagoons along the coast of this state, has been pretty thoroughly discussed, and the prospect is now good that some practical results will soon flow therefrom. A gentleman who has long taken great interest in the subject, and who was for many years a resident of the coast of the Gulf of California, made an effort to get a legislative appropriation last winter to transport oysters from Mazatlan, to plant in San Diego bay. He was not successful in this, but an act was passed "to encourage the planting and cultivation of oysters", which is intended to afford protection to the rights of those who may lay down oysters in any of the bays, rivers, or public waters of the state, and to secure them in the ownership of the property thus acquired.

This gentleman points out that the raccoon oyster, which is the native Lower California oyster, a bivalve of no mean merit, is found in great abundance in San Diego bay. There is far less fresh water there than in San Francisco bay, and the bottom is of that peculiar character so much esteemed at the East for oyster-breeding. He says that in those parts of Lower California where the raccoon oyster is indigenous, the oyster of the Mexican gulf coast is found to thrive equally well. He is also confident that the Mexican oyster would breed and thrive in numerous other bays along the coast of the state, notably at Wilmington, False bay, Trinidad, and San Buenaventura. In fact, anywhere that there is a lagoon, the water of which is regularly changed by the tides, he thinks that the Mexican oyster-cultivation

might be profitably carried on. He is not of opinion that foreshore cultivation will ever become anything like as extensive here as on the coast of France and other European countries, because there is not the requisite rise and fall of the tide.

Oysters can be had in unlimited quantities on the Mexican coast, from San Blas to Guaymas, for the mere cost of taking them away. The people and the authorities are anxious to aid in the development of the industry. It can now be undertaken with more favorable prospects of success than ever before. Every fourteen days a steamer leaves Mazatlan, and within four or five days afterward touches at San Diego. There are two estuaries between Mazatlan and San Blas, one distant thirty and the other sixty miles from Mazatlan, where oysters can be had in any quantity desired. The bivalves might be temporarily bedded at Mazatlan to await shipment. The gentleman above referred to estimate that oysters, equal in size and flavor to the best eastern, can be laid down here at a cost of less than \$25 per ton, while it costs \$100 a ton to get them here from New York. To insure success, he thinks that the projectors should have at their entire command a schooner of from 25 to 40 tons, the cost of victualing and manning of which would not exceed \$125 a month. The cost of gathering the oysters and putting them on board ship he estimates at \$3 per ton; cost of boxes, \$2 50; cost of shipment to Mazatlan, \$2 50 per ton; freight to San Francisco or San Diego, \$10 per ton; total, \$18 per ton; and the boxes could be used several times. If it were decided to bed the oysters in San Diego, they might, when nearly grown, be taken up and transplanted to this bay, where they would perhaps become fatter and finer flavored than if brought directly to market from San Diego. The canning of turtle could be made an adjunct to the business, for green turtles of the finest kind are found in the same lagoons with the oysters.

Another plan suggested of getting the Mexican oysters here, is to ship them from La Paz by the Colorado line of steamers, which makes the trip in seven or eight days. The experiment of transplanting oysters from the opposite coast of the Mexican gulf and bedding them at La Paz, has already been successfully tried. By this plan of shipment, Mexican oysters could be laid down at San Francisco every twenty days.

It is to be hoped that the effort will be once more made, under the remarkably favorable condition now existing, to give our people the benefit of the boundless supply of splendid oysters possessed by our southern neighbor. It is quite possible that the Mexican oyster may yet drive its eastern competitor out of our market, and thus the money which is now being expended at the East be retained at home.

Commenting on the same subject, the *Alta California* (February 13, 1874) said that there was every evidence that the Mexican oyster, "famous for its great size and fine flavor," would thrive in the bay of San Diego, and asks:

But who will venture the experiment? Not our own oystermen, certainly, for though the successful introduction and breeding of Mexican oysters might benefit the people of the state of California, it would be more than likely to take money out of the pockets of those who now enjoy the monopoly of the overland oyster-trade, by raising up a wholesome competition that would naturally reduce the prices of oysters in California, and more than probably make this an important state industry. Because our own bay is not favorable to the breeding of oysters, this may not be the case with any other of our bays, harbors, and lagoons. These last, especially, should be tried, and particularly the lake at Oakland; this could, with flood-gates, perhaps, be made an excellent place for the breeding of both fish and oysters, and there are many other similar lagoons along our coast. Oysters can be brought from the coast of Mexico to San Diego in four days, and at a cost of \$25 per ton, which is less than they can be bought for in the cities of New York.

A year later (January 27, 1875) the *Bulletin*, of San Francisco, announced the forming of a company "for the purpose of transplanting oysters from the Mexican coast", which had selected San Diego as their principal depot:

The capital stock is placed at \$1,000,000, divided into 10,000 shares. The Mexican oysters are now in fine condition, and will remain so until the rainy season sets in, in July. Beside stocking the bay of San Diego with plants and laying down a quantity of large oysters for summer supply, it is proposed to ship direct to San Francisco. Auxiliary to the shipping of live oysters, it is proposed also to dig oysters for the China market, and eventually to can and pickle them for the interior of Mexico. The Mexican officials are favorable to this enterprise.

## T. UTILIZATION OF OYSTER-SHELLS.

### 59. SHELL-LIME AND OTHER APPLICATIONS OF OYSTER-SHELLS.

**USES OF SHELLS.**—The utilization of oyster-shells is extensive and various. They serve as "metal" for roads and foot-paths; as "filling" for wharves, low lands, fortifications, and railway embankments; as cultch or stools for new oyster-beds; as ballast for vessels; as material for lime; and as a spreading for exhausted fields, or a component in mixed fertilizers, besides some minor uses, such as food for poultry, etc.

**HISTORICAL NOTES.**—In Rees' *Cyclopadia* of 1819, it is stated that a Mr. Homberg had found them to be a valuable medicine in case of acid stomach, and gave the following prescription for their preparation:

Take the hollow shells of the oysters, throwing away the flat ones as not so good; wash them perfectly clean, and then lay them to dry in the sun; when they appear dry beat them to pieces in a marble mortar; they will be then found to contain yet a large quantity of moisture; lay them again in the sun till perfectly dried, and then finish the powdering them, and sift the powder through a fine sieve. Give twenty or thirty grains of this powder every morning, and continue it three weeks or a month.—*Mem. Acad. Par.*, 1700.

One is astonished, upon first going to an oyster-locality, to see the huge piles of shells, and discover what spacious areas have been raised above tide-level or otherwise filled in with these animal structures. If there are 23,000,000 bushels opened annually in the United States, that is an equal measure of shells, and amounts to no less than 241,300,000 cubic feet. More than half of these are devoted to this purpose, and would spread three feet deep over a space more than 450,000 yards square, which would fill in a very respectable shallow.

The next largest portion of the emptied shells are converted into lime. Time was when no other lime was used by the early colonists. It is my opinion, from a careful examination, that the oldest structure of civilized masonry in North America, the famous Tower of the Northmen, at Newport, Rhode Island, is laid up with shell-lime.

What is supposed to be the earliest "poem" written in Pennsylvania, by one John Holme, celebrates the industry in language more explicit than flowery :

A few years since, it's known full well,  
Here lime was burnt of oyster-shell,  
No limestone in these parts was found,  
But since by searching in the ground  
Great store was seen in a short time,  
Of which some now make good stone lime,  
Which in its goodness doth excell  
That which was made of oyster-shell,  
And much cheaper 'tis at this time  
Than we paid for oyster-shell lime.

In New England, relics of its use abound in all the ancient settlements. At East Haven, Connecticut, for example, stands a church one hundred and four years old, the stones of which broke sooner than the oyster-mortar, when repairs were sought to be made upon the wall.

Kalm says it was abandoned in Philadelphia as soon as lime-stone was discovered, because of its tendency to absorb water. "The people shewed me some houses," he says, "in this town which are built of stone, and to the mason-work of which the lime of oyster-shells had been employed. The walls of these houses were always so wet, two or three days before a rain, that great drops of water could plainly be perceived on them; and thus they were as good as hygrometers."

**SHELL-LIME AS A FERTILIZER.**—At the present time it is as a fertilizer that shell-lime finds utilization, either by direct application upon the land, or by mixing it with barn-yard manure in the compost heap. This application of oyster-shells, either whole or after burning, is so important a matter, that I may be pardoned for quoting at considerable length the investigations made into its value at the Connecticut agricultural experiment station, in charge of Prof. S. W. Johnson, at New Haven. Samples were given them in November, 1879, of oyster-shell lime and screenings made by H. A. Barnes & Co., Fair Haven:

The slacked and unscreened lime which these two samples represent [says the report, in Bulletin 36, February 7, 1880] is sold by measure and not by weight. The price in November, 1879, was 8 cents per bushel at the work, and 9½ cents per car-load, shipped in bulk at the railway depot. The average weight of the screened slacked lime used for building purposes is stated to be 47 pounds per bushel. As the screenings amount to 3 to 5 per cent. of the total, it is not far from the truth to assume that the unscreened will weigh 50 pounds per bushel. The cost of this lime would be accordingly 16 cents per 100 pounds, at the kilns, or \$3 20 per ton. Shipped in casks holding 16 to 25 bushels, the lime cost about 1½ cents more per bushel, and the casks cost \$1 each, which would bring the cost of a ton up to about \$6 40, two casks included.

The screenings consist largely of imperfectly burned shells, entire or in fragments. They are not shipped, but are sold at the kilns for 4 to 6 cents per bushel.

The unslacked lime, of which we have no analysis, is stated to weigh on the average 70 pounds per bushel, and is sold in bulk at the railroad depot for 17 cents per bushel, or about 24 cents per 100 pounds, or \$4 80 per ton. Shipped in casks, its price is 19 cents per bushel, the casks costing \$1 each, which would make the ton cost \$7 70.

*Analyses of oyster-shell lime and screenings.*

	Sample No. 328.	Sample No. 329.	Sample No. 330.		Sample No. 328.	Sample No. 329.	Sample No. 330.
Lime .....	64.47	53.60	59.82	Chlorine .....	0.04	0.02	0.01
Magnesia .....	0.41	0.32	0.24	Phosphoric acid .....	0.17	0.10	0.15
Oxide iron and alumina .....	1.50	1.43	1.14	Silica .....	2.24	2.41	} 6.12
Soda .....	0.16	0.27	0.15	Sand .....	5.08	2.85	
Potash .....	0.04	0.06	0.03	Coal .....	0.65	0.94	2.00
Carbonic acid .....	7.79	8.80	22.34	Water (by difference) .....	10.93	28.33	18.17
Sulphuric acid .....	0.52	0.80	0.23		100.00	100.00	100.00

In the subjoined statement are given the proportions of the various chemical compounds that probably exist in the samples :

	Sample No. 328.	Sample No. 329.	Sample No. 330.		Sample No. 328.	Sample No. 329.	Sample No. 330.
Carbonate of lime .....	17.45	19.73	50.52	Sodium chloride (common salt) .....	0.07	0.03	0.03
Hydrate of lime .....	68.04	52.34	33.20	Oxide of iron and alumina .....	1.60	1.43	1.14
Sulphate of lime .....	1.12	1.48	0.40	Silica .....			} 6.12
Phosphate* of lime .....	0.37	0.41	0.33	Sand .....	5.08	2.85	
Silicate of lime .....	4.33	4.00		Coal .....	0.65	0.94	2.00
Magnesia .....	0.41	0.32	0.24	Water .....	0.60	13.29	4.97
Carbonate of potash .....	0.06	0.09	0.04		100.00	100.00	100.00
Carbonate of soda .....	0.22	0.43	0.24				

\*The small amount of phosphorus in oyster-shells causes them sometimes to be phosphorescent, and it is said that they become distinctly so by being thoroughly calcined. A kind of commercial phosphorus, known as Canton's, was anciently made of them, which had peculiar properties, and was not so delicate as some other sorts.

On referring to the results of these analyses, we notice that the two samples of lime contain about 9 per cent. of sand and coal, or of substances mostly derived from them, viz, oxide of iron, alumina, and silica. We have small quantities of potash, soda, magnesia, phosphoric and sulphuric acids, altogether amounting to 1.5 per cent. Both samples contain also nearly equal quantities of carbonic acid, viz, 8.3 per cent. Lime, the chief ingredient, varies from 54.5 to 53.6, or nearly 11 per cent., and water from 17 to over 28, also 11 per cent. Looking now to the statement of the proportions of the compounds probably existing in the samples, we see that in the two samples of slacked lime the chief ingredient is hydrate of lime (or calcium hydroxide); next to this in quantity comes carbonate of lime (or calcium carbonate), followed by silicate of lime 4.05 per cent., sulphate 1.03 per cent., and phosphate 0.4 per cent.

THE CHEMISTRY OF LIME MANUFACTURE.—A brief review of the chemistry of the lime manufacture may be serviceable. Clean oyster-shells consist chiefly of carbonate of lime. As they are used in lime manufacture they contain probably about 7 per cent. moisture and organic matter, about 6 of soil and sand, and 87 per cent. of carbonate of lime. In passing through the kiln the carbonic acid is mostly expelled. If completely expelled the loss would be 38 pounds of carbonic acid for 100 pounds of shells, leaving 49 pounds of quicklime (calcium oxide). With this would of course remain the sand, mud, etc., that originally adhered to the shells, together with the ashes of the coal used in burning. The lime thus obtained is slacked by throwing on water, in order to reduce it to a powder. In this process of slacking, water and lime enter into chemical combination, the 49 parts of lime becoming 64 parts of hydrate of lime. In practice some carbonate of lime remains undecomposed by the burning, and, in the slacking process, the use of insufficient water may leave some quicklime unconverted into hydrate, or excess of water may remain as moisture, as is the case with sample 329. When applied to land, oyster-shell lime may act as a fertilizer, strictly speaking, or as an amendment. Commonly, both kinds of action are exerted, and the distinction between fertilizer and amendment is not generally recognized in practice, although very important in considering the effects of this substance. Lime is used as an amendment on heavy clay soils, two to three or more tons being sometimes applied per acre. On loams or light lands 1,000 pounds, or 20 bushels of oyster-shell lime, applied once in two or three years, is a usual application, equivalent to the addition of 300 to 500 pounds to the acre annually. It is evident that the small quantities of potash, magnesia, and phosphoric acid contained in such doses of oyster-shell lime can have no sensible effect upon crops. It is the lime alone, therefore, to which any benefit must be ascribed. A consideration of the modes of action of hydrate of lime, when applied as a fertilizer, will make it evident that it is one of the most valuable aids to the farmer, and deserves more attention from Connecticut land-owners than it has received. Our cultivated crops contain, on the average, as much lime as potash. The necessity for the application of potash salts is fully recognized, but probably the lack of lime is as common a cause of unfruitfulness; for while potash seldom wastes from the soil to any serious extent, and is found in spring, well, and river waters in extremely small quantities, lime freely dissolves in water and rapidly wastes from the soil, so that, other things being equal, there is more need for its restoration.

ANALYSIS OF SHELL-MARL AND MARINE-MUD.—Diverging slightly from this, Professor Johnson analyzes in the same report samples of shell-marl and marine-mud, which it was proposed to put on sale as manures, and it seems worth while to quote the result of his important studies, as follows:

The sample of shell-marl examined came from West Cornwall, and was found to be composed of—

Moisture.....	23.92
Silica, sand, and insoluble matter.....	16.88
Oxide of iron and alumina.....	1.55
Lime.....	27.99
Magnesia.....	0.97
Soda.....	0.59
Potash.....	trace.
Sulphuric acid.....	0.46
Phosphoric acid.....	trace.
Carbonic acid.....	21.77
Organic matters * by difference.....	5.87
	100.00

This shell-marl consists of carbonate of lime to the extent of 40 per cent., and contains 2 per cent. of carbonate of magnesia, also 0.9 per cent. of sulphate of soda, and 0.25 per cent. of carbonate of soda. The organic matter includes nearly 0.5 per cent. of nitrogen, in organic combination. There can be no doubt that its employment, in liberal quantities, viz, one or more tons per acre, especially upon grass lands, would often be attended with decided and long-continued benefit, but, in most cases, its action upon grain crops would not appear at once in so decided a manner as is very commonly the case with good superphosphates or guanos.

The fertilizing effects of this shell-marl, as well as its commercial value, may be safely measured by the percentage of lime which it contains. Its effects on crops would be in general quite similar to those of oyster-shell lime, although somewhat less pronounced, since carbonate is a less energetic agent than hydrate of lime. Its content of lime, 28 per cent., is less than one-half as much as that of the two samples of slacked unscreened oyster-shell lime described on a previous page, whose average is 59 per cent. As 1,000 pounds of the latter costs, at New Haven, shipped in casks, \$3 20, it is evident that the proposed price of the marl, \$15 per ton, is much too large, even after making the most liberal allowance for cost of handling.

A sample of black mud, containing some seaweed from salt water at Saybrook, was sent to the station by George M. Denison, esq., who states that it is exposed at low tide, and can be got upon the land for about 25 cents per load. Chemical analysis assigned to it, of—

Water.....	71.32
† Organic and volatile matters.....	2.79
Sand, clay, and substances insoluble in acid.....	20.82
‡ Oxide of iron and alumina.....	2.62
Lime.....	0.26
Magnesia.....	0.52
Soda.....	0.60
Potash.....	0.17
Chlorine.....	0.51
Sulphuric acid.....	0.39
Phosphoric acid.....	trace.
	100.00

\* Containing organic nitrogen, 0.44.

† Contains nitrogen, 0.14 per cent.

‡ Most of the iron exists as protoxide.

This mud, says Professor Johnson, contains, in fertilizing elements, the small amounts of nitrogen, lime, magnesia, soda, potash, chlorine, and sulphuric acid given in the analysis, altogether amounting to about 2½ per cent. of the total. But stable manure—the standard fertilizer—contains about the same amount of plant-food, and of the same kinds, except that it has less sulphuric and more phosphoric acid, less soda and more potash. The mud, when used judiciously, will prove an excellent fertilizer. Doubtless other samples might contain more phosphates. In any case, the mud, used copiously, together with fish, which are rich in nitrogen and phosphates, and with seaweed, which contains abundant potash, will supply all the plant-food that crops require, and serve to maintain or increase fertility of the soil to the fullest degree. The only drawback to the use of the marine mud lies in the considerable proportion of soluble salts, mostly common salt, which it contains, being nearly 1 per cent. If thrown out in heaps and exposed to the rain this salt will be mostly removed. The mud may also be applied directly to the root-crops or grass in moderate quantities, without damage, if well distributed. As an amendment the fine mud must have an excellent effect on coarse-textured soils.

**SHELL-HEAPS AND THEIR USE.**—In Florida and the Gulf states, the best farms and gardens are those located upon the shell-mounds, where the finest trees grow; and in the northern states these old heaps have long been resorted to by farmers as a store-house of top-dressing for their fields. The immense banks at Damariscotta, described in the chapter on the Gulf of Maine, are constantly utilized for this purpose. The shells are first burned, and the remains of various rude kilns exist, one of which greatly excited the antiquarians who first exhumed it, who were sure they had hit upon an aboriginal, prehistoric home, until they found half a brick in the bottom. Within a few years Mr. Charles Metcalf has built a more substantial kiln and has burned there a large quantity of shells; but he was unable to give me any estimate of what this manure cost him, or the probable value of the heaps, if used for this purpose. He had never sold any shell-lime either for use in mortar or on the fields. Hereafter these deposits may prove an important aid to agriculture in the district, and they are practically inexhaustible. Similar great heaps of half-decayed shells exist in northern New Jersey, from one of which an immense mass of material has been hauled for road-making, and also to be used as ballast in oyster-vessels bound for the Chesapeake bay, where it would be thrown and serve as the best cultch for any spat which might float by.