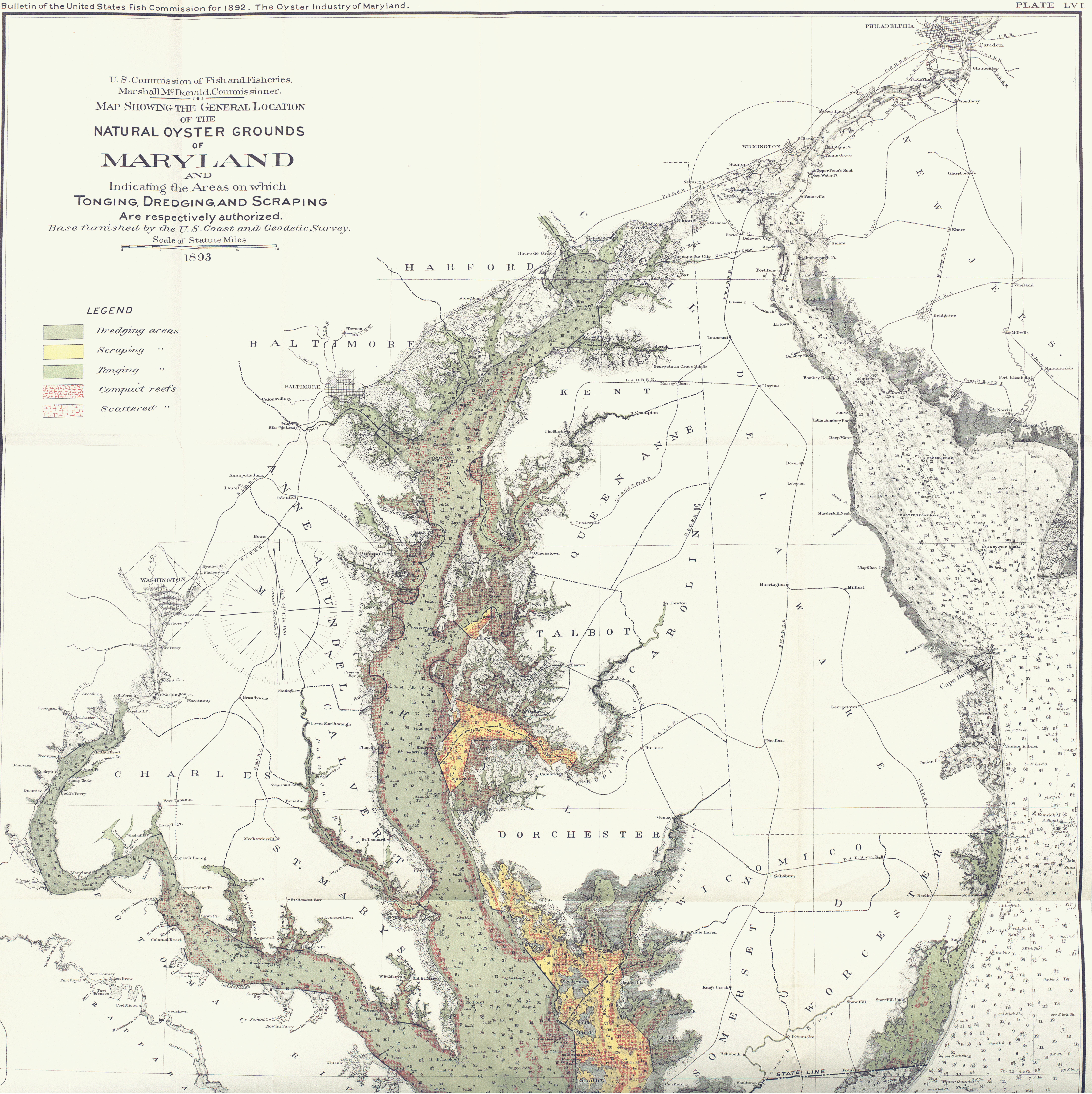
U. S. Commission of Fish and Fisheries.
Marshall McDonald, Commissioner.
MAP SHOWING THE GENERAL LOCATION OF THE
NATURAL OYSTER GROUNDS
OF
MARYLAND
AND
Indicating the Areas on which
TONGING, DREDGING, AND SCRAPING
Are respectively authorized.
Base furnished by the U. S. Coast and Geodetic Survey.
Scale of Statute Miles
1893
LEGEND
Dredging areas
Scraping "
Tonging "
Compact reefs
Scattered "
PHILADELPHIA
Camden
WILMINGTON
BALTIMORE
WASHINGTON
Annapolis
HARFORD
BALTIMORE
KENT
QUEEN ANNE
ANNE ARUNDEL
TALBOT
CAROLINE
CALVERT
CHARLES
DORCHESTER
ST. MARYS
WICOMICO
SOMERSET
WORCESTER
DELAWARE
NEW JERSEY
POTOMAC
RAPPAHANNOCK
STATE LINE
Cape Henlopen
Cambridge
Easton
Salisbury
Havre de Grace
Dover
Chestertown

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5.—THE OYSTER INDUSTRY OF MARYLAND.

INTRODUCTORY NOTE.

Among the fishery industries of the United States the oyster fishery ranks first in importance, and of the States engaging in this fishery Maryland occupies the most prominent position. The attention given to oyster fishing and oyster cultivation in recent years has been one of the most prominent features of the fishery industries, and has resulted in a great and growing demand for practical literature on the subject, which it has been the aim of the U. S. Commission of Fish and Fisheries to supply.

The present paper is one of a series of special articles relating to the oyster industry which this Commission has issued or has in course of preparation. From a very early period in its history, the Commission has constantly had in view the importance of the oyster as a food product and has carried on inquiries addressed to the biological, physical, economical, and statistical aspects of the industry. The previous reports presented by the Commission are very numerous and cover almost every phase of the subject. Among the recently issued papers the following relating to the Atlantic coast may be mentioned: "Notes on the Oyster Industry of Connecticut," "The Physical and Biological Characteristics of the Natural Oyster-Grounds of South Carolina," "An Investigation of the Coast Waters of South Carolina with reference to Oyster-Culture," and "Report on the Coast Fisheries of Texas."

In addition to the work represented by the foregoing reports, biological and topographical surveys have been conducted in Long Island Sound, Chesapeake Bay, and Galveston Bay, full accounts of which have not yet been printed. The oyster fishery of the west coast has been dealt with in two special papers, "Report upon Certain Investigations relating to the Planting of Oysters in Southern California" and a "Report of Observations respecting the Oyster Resources and Oyster Fishery of the Pacific Coast of the United States." For the purpose of instituting comparisons and affording opportunity to apply the methods of cultivation employed in other countries so far as they may be applicable to the United States, inquiries have also been conducted in all the countries of Europe having oyster fisheries, and two reports based on these studies have been printed, one entitled "The Present Methods of Oyster-Culture in France," the other a "Report on the European Methods of Oyster-Culture." In the regular descriptive and statistical fishery reports of the Commission relating to the different geographical coast sections of the country, the oyster fishery has also received due notice.

This article is a contribution to the economic phase of the oyster industry. It emanates from the Division of Statistics and Methods of the Fisheries of this Commission and is based largely on the personal observations and inquiries of the author,

Mr. Charles H. Stevenson. The report consists of a history of the oyster industry of Maryland from early times, a review of the legislation by which the fishery has been regulated, a description of the oyster-grounds of the State, a detailed account of the methods employed in taking oysters, a notice of the progress of oyster-culture in Maryland, a history of the State oyster police and of the oyster-revenue services, statistical tables showing by counties the extent of the industry in recent years, and a discussion of the transporting, packing, and marketing trades.

The extent of the oyster industry of Maryland in the season of 1891–92, as determined by the investigations carried on by this office, may be summarized as follows: The number of persons engaged in various capacities was 33,388; of these, 10,813 were employed in tonging oysters, 5,059 in dredging, 3,757 in scraping, 1,651 in transporting only, and 12,108 as shore and factory hands. The vessels employed numbered 1,624; the number of boats used was 6,554; the vessels and boats, with their outfit and apparatus, were worth $2,618,745. The capital invested in the shore and accessory property devoted to the packing and marketing trades was $4,650,500. The total investment in the industry was therefore $7,269,245. The quantity of oysters taken and sold was 11,632,730 bushels, for which the fishermen received $5,866,120.

The report is accompanied by 15 plates illustrating fishing methods and appliances and a chart showing the location of the oyster-grounds and indicating the respective areas on which tonging, scraping, and dredging are authorized.

MARSHALL MCDONALD,
U. S. Commissioner of Fish and Fisheries.

WASHINGTON, D. C.,
November 29, 1893.

THE OYSTER INDUSTRY OF MARYLAND.

BY CHARLES H. STEVENSON.

INTRODUCTION.

Few branches of the American fisheries have been the subject of so much discussion and are so little understood as the oyster industry of the State of Maryland. For fully eighty years this fishery, by reason of its condition and importance, has demanded the attention of the tide-water residents of that State, and at nearly every session of the Maryland general assembly since 1820 it has been one of the most fruitful subjects for legislative enactments; yet a system of regulation satisfactory either to the oystermen or to the State at large has not been established, and at no previous time in the history of the fishery has it received the amount of attention as at present.

A discussion of this industry is especially interesting because it is the most extensive and valuable oyster fishery in the world. In European countries and in the majority of the oyster-producing States of America the food market receives the greater portion of its supplies from private grounds, the regulations governing the common or free fisheries being largely subsidiary to the needs of the industry on the private areas. Maryland, however, has persistently refused to encourage an extensive development of private oyster fisheries, devoting instead all its energies toward conserving and protecting the free fishery on the public domain.

The purpose of this paper is to discuss all branches of the oyster industry of Maryland, from the operations of the oystermen to the preparation of the marketable products, the investigation being chiefly from an industrial point of view. Brief but complete notice is taken of the regulations that have surrounded the industry since its inception, as it exhibits the constant efforts made by a people during a period of seventy years to preserve the prosperity of a common fishery. Reference is made for the first time to the planting or bedding operations conducted in the Sinepuxent Bay, and the small business done in this line in other portions of the State. Only the actual and relative conditions of the industry in its various branches are discussed, and no attempt is made to add to the interest or volume of the paper by describing the many unique and novel methods and customs prevalent in certain localities, unless the same have some bearing upon the prosperity of the industry.

Probably no State in the Union has for its area so great an inland water-surface as Maryland. Of the twenty-three counties in this State, the oyster fishery is prosecuted from eleven, in which, because of the innumerable tributaries of the Chesapeake extending into the land, there are few localities removed a greater distance than 6 miles from navigable water, thus bringing all the residents into close contact with the fisheries. The total population in 1890 of these eleven counties was 219,307, and

the oyster industry is by far the principal means of support. This does not include the city of Baltimore with its extensive dredging, transporting, and marketing interests, giving direct employment to 11,000 persons and support to many times that number.

The dependence of a large proportion of the citizens of Maryland upon this fishery for a livelihood, and the immense resources it furnishes for the profitable employment of capital and labor, demand that the fullest inquiry be made into its needs and conditions, and should cause everyone interested either in the welfare of Maryland or in the fisheries of America to be extremely solicitous that no permanent injury to it should be permitted and that every available means be utilized toward maintaining and, if practicable, increasing the productive capacity. Neither is the interest in this industry limited to the State of Maryland, for nearly every locality in America is to some extent dependent for the abundance and cheapness of its oyster supply on the product of the Chesapeake, and this interest is also shared by the foreign consumer of the canned product.

In every region of the world where the oyster industry has assumed any commercial importance it has passed, or is apparently passing, through the following four stages: First, the natural reefs in their primitive condition and furnishing the entire supply of oysters; second, those reefs somewhat depleted and producing small oysters, many of which are transplanted to private grounds and under individual protection permitted to mature; third, the public beds so far depleted that the supply available is very irregular and uncertain and consists almost entirely of small oysters which are transplanted to private areas; fourth, the entire dependence of the industry on areas of ground under individual ownership or protection.

In Europe the greater number of the oyster-producing localities are in the condition of the fourth stage. In America, with apparently a more hardy oyster, the natural advantages greater, and the fisheries not so long continued, the industry still depends largely on the public reefs. But were it not for the supply of seed oysters obtained from more southern waters all those States north of Connecticut would be practically in the condition of the fourth stage, the public reefs in that region being almost totally destroyed. Connecticut, New York, New Jersey, and Delaware, while obtaining large quantities of small oysters from the Chesapeake and other localities, are rapidly passing from the third to the fourth condition. The oyster industry of Chesapeake Bay, both in Maryland and Virginia, is in the second stage, but the history of the fishery in other States and countries excites grave fears as to its long continuance in this condition.

In Maryland the oyster industry is at present almost totally dependent on the public reefs, and there are two great interests in the fishery which, for nearly a century, have been antagonistic to each other, viz, the tongmen and the dredgers with their allies the scrapemen, and these three unitedly wage common war on the planters. The dispute between the tongmen and dredgers is of economic origin, being due to the improved machinery of the latter surpassing that of their rivals. The common objection to the planters is founded in the belief that their operations constitute an encroachment upon the public customs, and that the free fishery on the public reefs may thereby be seriously restricted. These class feelings have had much to do with preventing a satisfactory understanding of the fishery and its regulation in a manner acceptable to the State at large.

In studying this fishery in Maryland and comparing its needs and conditions

with those of this industry in other localities, consideration must be taken of the enormous extent to which, during the last twenty-five years, it has been prosecuted. The water area of Maryland is the greatest oyster-producing region in the world, and the output of the industry is fully equal in value to one-sixth of the product of all the fisheries of the United States combined and gives employment to one-fifth of the persons engaged therein.

For purposes of comparison the following tabular statement is submitted, showing either approximately or by latest returns the catch of oysters from public and private areas in each of the various States of America and the principal foreign oyster-producing countries:

Table showing the oyster product of the world.

State or country.	No. of bushels.	Value.	Year.
Massachusetts	58,007	$81,938	1892
Rhode Island	172,945	241,978	1892
Connecticut	1,940,174	1,426,244	1892
New York	2,611,062	2,748,509	1891
New Jersey	2,632,117	1,746,930	1892
Pennsylvania	132,380	101,850	1892
Delaware	175,332	73,863	1892
Maryland	11,632,730	5,866,120	1892
Virginia	5,984,636	2,487,638	1891
North Carolina	807,260	175,567	1890
South Carolina	63,150	23,204	1890
Georgia	224,355	40,520	1890
Florida	468,431	93,692	1890
Alabama	481,070	107,812	1890
Mississippi	806,478	166,672	1890
Louisiana	841,585	299,896	1890
Texas	440,800	127,990	1890
Washington	142,730	127,000	1892
Oregon	2,500	3,125	1892
California	178,645	698,257	1892
Total for United States	29,796,387	16,638,805	
Canada	152,580	183,846	1891
British Isles	2,760,000	6,200,000	Approx.
France	2,000,000	5,000,000	Do.
Holland	70,000	440,000	Do.
Italy	65,000	200,000	Do.
Germany	13,000	75,000	Do.
Miscellaneous	400,000	600,000	Do.
Total for foreign countries	5,460,580	12,698,846	
Grand total	35,256,967	29,337,651	

It is thus observed that the quantity of oysters produced in Maryland is one-third of the total product of the world and more than twice as great as that of all foreign countries combined.

This report is largely the result of observations and inquiries made by the writer, as an agent of the U. S. Fish Commission, during extended trips through the tide-water counties of Maryland and of examinations of the voluminous State and county records. Liberal and valuable assistance has been accorded the work by the State and county officials and many other persons in positions to be informed respecting the oyster industry. Especial acknowledgment is made to Gen. Joseph B. Seth, sometime commander of the State fishery force, to Mr. William D. Platt, an extensive oyster-dealer of Baltimore, Marion deK. Smith, esq., comptroller of the State treasury, Col. Thomas S. Hodson, and Conway W. Sams, esq. Acknowledgment is also due Mr. Daniel Bendann, of Baltimore, for the use of an excellent series of photographs illustrating the various phases of the oyster industry of Maryland.

GENERAL HISTORICAL NOTES.

In order that the present condition of the oyster industry of this State may be properly presented and understood, it is necessary to review its conditions and methods of prosecution in former years. There have been three great eras in the history of the oyster industry in Maryland, viz: First, from the settlement of the State to 1820, during which the fishery was in its infancy, subject to no restrictions or regulations whatever except those of nature and market demands, the product being very small; second, from 1821 to 1864, during which the use of dredges in catching oysters was interdicted and the wholesale shucking trade was established and considerably developed; third, from 1865 to the present date, in which a license system has been operative, authorizing the use of tongs, dredges, and scrapes under certain regulations, the places and times of their employment being restricted.

Prior to 1820.—The heaps of oyster shells found in some places along the shores of the Chesapeake indicate that these mollusks had for a long time been utilized for food purposes by the Indians; and the writings of the early settlers of and travelers to this part of the country make reference to the fact that the aborigines at times furnished them with oysters in exchange for trinkets and other commodities. The Chesapeake colonists appear to have given little attention to them. An explanation for this is probably found in John Smith's "Advertisements for Unexperienced Planters," published in 1631, in which he explains the reasons why the early settlers of the Chesapeake did not engage in fishing by stating: "Now although there be * * * Fish in the rivers * * *, yet the rivers are so broad * * * and we so unskillful to catch them, we little troubled them nor they us."

There are many reasons for the belief that, for years after the settlement of Maryland, oysters were regarded as of little value for food purposes. Diligent search among the early colonial records has resulted in the finding of but one reference to this product. This reference, which is certainly depreciatory, occurs in the depositions made in the famous Claiborne suit of about 1680, in which the "Kent Islanders" cited, among their grievances and the hardships which they had to endure, that their supply of provisions becoming exhausted it was necessary for them, in order to keep from starvation, to eat the oysters taken from along the shores.

As no further mention of them is found among the voluminous colonial papers, it is reasonable to suppose that after the settlement of Maryland a long time elapsed before oysters entered largely into the food supplies of the inhabitants, hence there was little object in catching them. During the war of 1812, occasional reference was made in the newspapers of that period to the part played by the oystermen of the Chesapeake in harassing the British fleet in the bay, from which it is evident that at that time the fishery was of some consequence.

It appears from records and traditions that a large portion if not the greater quantity of the oysters then caught were transported by vessels to Northern markets, a considerable demand for them having been developed in the New England States; and, beginning about 1808, a number of vessels each season transported several cargoes to Fair Haven, Conn. The vessels resorted to the reefs situated in the lower part of the bay, and obtained cargoes either by dredging or by purchasing from the tongmen living along the shores, who oystered especially for those vessels. It was

by the transporters that the use of dredges was largely extended in Maryland waters, this being to some extent necessary for the transportation trade, when the State of Virginia, by act dated January 9, 1811 (Laws, Va., 1810–11, ch. xvii), interdicted the use of these implements within the waters of that State. No wholesale markets existed along the shores of the Chesapeake for the handling of oysters, and it is probable that the local consumption was very small.

From 1820 to 1864.—The quantity of oysters for the Northern markets, while not large in view of the present knowledge regarding the productiveness of these reefs, was sufficient to alarm the oystermen of that time lest their industry should thereby become totally destroyed. These apprehensions resulted, in 1820 (L. 1820–21, ch. 24), in the earliest enactment of the general assembly of Maryland regulating or affecting the oyster industry, the annual product of the State at that time scarcely exceeding, if it equaled, 500,000 bushels. Because of the insight it offers into the fishery as it then existed, the preamble to this enactment is here given:

> Whereas it is represented to the general assembly that a great number of large vessels from the Northern and Middle States frequent our waters for the purpose of transporting oysters to those States; and whereas well-grounded apprehensions are entertained of the utter extinction of oysters in the State, as well in consequence of the immense quantity thereof exported as the destructive implements used in catching them: Therefore, etc.

This enactment prohibited, under penalty of a fine of $20 or sixty days' imprisonment, the use of any implements in catching oysters within the State other than the ordinary tongs, and also the transportation of oysters out of the State in vessels not owned wholly for the preceding twelve months by a citizen of the State, or placing oysters on board any such vessel to be transported. Because of the great expanse of water territory, and the difficulty of enforcing the law without competent physical force upon the bay, this enactment did not fully prevent the continuation of the trade by Northern vessels.

During the next session of the general assembly an exception was made (L. 1821–22, ch. 107) to the law of 1820, and permission was given to each citizen of the State of Delaware living within 3 miles of the northeast branch of the Nanticoke River to catch oysters from that branch of said river in quantities not exceeding 30 bushels per day; a privilege which they enjoyed for many years and to which may be due in some respects the extensive oyster-shucking trade now prosecuted at Seaford. This is one of the very few instances in which a State has, by legislative enactment, authorized non-residents to take fishery products from within its borders.

On February 16, 1830 (L. 1829–30, ch. 87), an important enactment was made embodying almost the first oyster-planting law operative in America. This act authorized citizens of the State to preëmpt, under certain regulations, an acre of ground naturally unproductive of oysters, for the purpose of planting and growing oysters and other shellfish thereon. It also granted to the owner of lands bordering a creek less than 100 yards in width at its mouth the exclusive right to the use of the same for a similar purpose. The productiveness of the natural reefs having apparently continued to decrease since the enactment of 1820, this act further interdicted the use of tongs having more than six teeth on a side; but this restriction, so far as it applied to the waters of the Eastern Shore, was repealed at the same session of the legislature, the prohibition of their use on the Western Shore remaining until 1834. The act also provided that no persons other than citizens of the county or counties bordering on any river or bay should catch oysters within 300 yards of low-water mark

of either shore of said river or bay. In this provision originated the distinction between "county waters" and "State waters," the latter being such areas as are open for the use of any resident of the State—a distinction which, though modified and changed to a considerable extent, has remained to the present day.

Some difficulty was experienced in enforcing this enactment, and at the next legislative session (L. 1831–32, ch. 249) more easily applied penalties and court regulations were provided for its enforcement in the waters of the Eastern Shore, and in the following year the same provisions were applied to the Western Shore (L. 1832–33, ch. 265). The necessity for these provisions was intimated in the preamble to the first one, as follows:

> Whereas the protection of oysters in the waters of this State is a subject in which the citizens thereof are deeply concerned, and the legislature of Maryland by sundry laws passed for that purpose have sought to secure the advantages resulting from that article of trade, which have fallen short of the object they were designed to accomplish; and
>
> Whereas the citizens of this and other States infesting said waters have continued to take and carry away oysters in violation of the laws upon this subject enacted; and it is justly apprehended that oysters in the waters of the State will be destroyed, not less by the immense number carried away than by the destructive implements used in taking them; and
>
> Whereas the navigation of many creeks has been obstructed by the citizens of this and other States by means of the heaps of the refuse thrown into the waters of said creeks in the process of picking [culling] the oysters for market, to the great injury of the good people of this State. * * *

During the twenty-four years following 1830 few important changes were made in the regulations of the fishery, but it was an era of great development in the extent of the industry. The opposition to the transportation of oysters out of the State and the cost of doing so when that opposition was overcome induced a number of oyster marketmen from New England to establish shucking-houses in Baltimore for shipment of the Chesapeake stock throughout the country, and the increased demand naturally led to an extension of the fishery. The first of these houses was established in 1836 and others were started within a few years.

In 1840 it was estimated that the quantity of oysters used by the shucking trade during the previous season amounted to 710,000 bushels, and there was a large additional quantity consumed along the shores. During the years immediately following 1840 many of the large reefs in the Tangier region were discovered, resulting in a greater development of the fishery in that section. About 1846 the canning of oysters was begun and the extension of this branch of the trade rapidly increased the demand for the product of the reefs.

In the meanwhile, however, additional restrictions were placed on the fishery, of which the following were the most important. In 1836 (L. 1835–36, ch. 216 and ch. 260) the catching or burning of oysters for purposes of fertilizing land was prohibited in portions of Dorchester and St. Mary counties, and in 1840 (L. 1839–40, ch. 103) the same practice was prohibited in Somerset County. By act of 1837–38, ch. 310, it was made unlawful for any person other than residents of the counties bordering on the same to catch oysters within 500 yards of low-water mark in any waters of the State, and in cases in which a creek or river is the divisional line between two counties the privilege of taking oysters therefrom belonged to the residents of those counties in common and to none others. By act of 1845–46, ch. 240, the catching of oysters in the waters of Worcester County between April 13 and September 1 of any year was interdicted, this being the first close season operative in Maryland and one of the earliest in America.

In 1852 (ch. 57) the removal of empty shells from any oyster reefs in Worcester County for any purpose whatever was prohibited. These shells were generally manufactured into lime. The quantity of small oysters and shells used from 1810 to 1860 for fertilizing purposes after being burned, or without that treatment, is surprisingly large. The oysters together with the empty shells and débris, or the "run of the rock," could be purchased in large quantities for 2 to 4 cents per bushel, a tongman being able to catch from 40 to 100 bushels per day. The stock was of the same grade as now sells for 10 to 20 cents per bushel for planting purposes. The lime was worth from 3 to 8 cents per bushel, and was spread over the land sometimes as plentifully as 75 or 100 bushels to the acre. By this method of treatment large areas of land that produced nothing but June grass were made very productive by further cultivation. The use of oysters for this purpose continued in some localities of Maryland even as late as 1875, and it is stated on reliable authority that in 1873 oysters were sold at 2 cents per bushel in Talbot County for this use.

In 1854 (L. 1854, ch. 4) a material change was effected in the fishery, and the use of the reefs of the State by the tongmen exclusively was modified by it being made lawful for citizens of Somerset County to take oysters with small dredges or scrapes in any of the waters of that county not part of a creek and not within 200 yards of the shore and not less than 21 feet deep. Before engaging in scraping (as this form of oystering when prosecuted within the limits of a county is now designated) each vessel was required to obtain a license at a cost of $15, the revenue derived therefrom being applied to the school fund of the county. This was the first oyster license law operative in Maryland, and almost the first in America.

The military operations in Maryland and Virginia from 1861 to 1865, and the consequent disorganization of the oyster trade, put a temporary check on the advance of the fishery. But the market demand for oysters increased, being due largely to the extension of the canning trade during that period, and consequently the prices ruled high, the average received by the oystermen in 1863–64 and 1864–65 being about 70 cents per bushel. This resulted in great prosperity to those fishermen who were successful in continuing their operations.

From 1865 to 1893.—This period practically covers the time in which the industry has been of great extent and importance. The discontent among the oystermen of other counties at the special privilege enjoyed by the residents of Somerset under the act of 1854 (ch. 4), the high rate at which oysters were selling by reason of the recent military operations and the fact that (by means of tongs) oysters in depths of water greater than 23 feet could not readily be obtained, together with the great difficulty in enforcing the law then existing, led in 1865 (ch. 181) to a repeal of the entire body of the general law affecting the oyster industry and the enactment of another in lieu thereof, the general features of which have remained to the present time.

The principal changes effected by the new law were as follows: It required that no person should engage in catching oysters within the waters of the State for purposes of sale with any implement whatever without first having obtained an annual license for the boat or vessel employed. For every boat engaged in tonging, the owner thereof was required to pay a license fee of $5. The fee for dredging was at the rate of $5 for each ton of measurement of the vessel employed, and the use of dredges was authorized only from September 1 to June 1, and within specified portions of the Chesapeake Bay. All license fees were to be paid into the State treasury, and no steamboat or steam machinery was permitted to be used in catching oysters.

The scraping law previously operative in Somerset County was not affected by this enactment. The principal change effected in the provision of law authorizing the preëmption of ground for the purpose of planting oysters or other shellfish was in increasing the limit of area obtainable by each individual owning land along the foreshores from 1 to 5 acres. No provision was made for the preëmption of planting lots by other persons, but this was remedied two years later. The procedures for the enforcement of the law and the penalties for violations were fully defined. Among the former may be mentioned the granting of full powers of sheriff in enforcing the law to all persons employed on licensed vessels.

During the first season in which the license system was operative, 1865–66, the number of tonging boats licensed was 1,658, and of dredging vessels and boats 391. In that season, according to data furnished by the late Mr. C. S. Maltby, the catch by tongs amounted to 1,216,375 bushels, and by dredges and scrapes 3,663,125 bushels, making a total of 4,879,500 bushels.

Since the license enactment of 1865 frequent changes have been made in the times, places, and methods in which the various branches of the fishery might be prosecuted, as well as in the amount of license fees required to be paid; but detailed reference to these changes will be found in the discussion of the various branches of the oyster industry.

The difficulty experienced in compelling some of the dredgers to obtain licenses and in preventing them from operating on interdicted areas led, in 1868, to the organization of the State fishery force, consisting of a number of vessels, suitably armed and equipped with officers and men, to patrol the bay and tributaries in search of violators of the oyster law and to arrest the same when found. The act providing for this force also prohibited the catching of oysters on Sunday, and in 1870 (ch. 364) the taking of oysters at night—that is, between sunset and sunrise—was also interdicted. But it was for many years difficult to prohibit this practice.

In 1870 the use of scrapes was authorized, under very restricted conditions, in certain waters on the southern shore of Dorchester County, and in 1874 they were permitted on the northern shore of that county and in certain waters of Talbot County.

By act of 1872 (ch. 131) an exception was made to the general license system of the State, and residents of Worcester County were exempted from its provisions; but in 1874 (ch. 77) the tongmen in that county were again required to obtain license, each man paying $3 therefor, the revenue thereby derived to be devoted to the purchase of seed oysters, to be planted in Sinepuxent Bay. In the last-named year (L. 1874, ch. 181) the first general close season on tonging was established, the exempted time being from May 1 to September 1.

During several seasons following 1870 the catch of oysters ranged between 9,000,000 and 14,000,000 bushels. But from 1876 until 1881 the fishery was not so prosperous, either as regards the number of persons employed or the quantity and value of the products, the latter amounting in 1879–80 to 10,600,000 bushels, valued at $3,869,000.

From 1882 until 1886 the fishery again increased largely in extent; but less prosperous years following led, in 1890 (ch. 602), to the adoption of the famous "cull law," which is generally admitted to be one of the best protective measures ever enacted, if properly enforced. Although cull laws have prevailed in portions of Europe, notably the English Channel, almost continuously since 1839, this has never been a popular

protective measure in America, and in only one or two States is a provision of this kind operative, Maryland being almost the first to attempt the enforcement of such a regulation; indeed, restrictions as to the size of the oysters to be taken are not now very popular abroad. The reason for this is that in most of the other American States that have given attention to the oyster industry, as well as in the oyster-producing countries of Europe, the present regulations of the common fishery are auxiliary to the needs of the private or several fisheries, and the public-reef fishermen make no complaint, for they are thus enabled to market their small oysters among the planters.

As even the smallest oysters caught in Maryland could be utilized in the steaming-houses of that State, or sold for bedding in other localities, the fishermen found a market for all they took from the water and did not attempt to carefully cull and return the small ones to the beds to increase in size for another season. A 1½-inch cull law had been enacted in 1886 (ch. 569) for the waters of Somerset County, but the difficulty in enforcing a local law of this nature rendered it almost inoperative. The general cull law as operative at present is as follows:

> All oysters taken from any of the waters of this State (either with scoops, dredges, or any similar instruments, or tongs or rakes) shall be culled upon their natural bed or bar as taken, and all oyster shells, and oysters whose shells measure less than two and one-half inches in length, measuring from hinge to mouth, shall be included in said culling and replaced upon said bed or bar as taken.

This regulation required such a change in the practices of the oystermen who had been accustomed to market oysters of all sizes that it was at first regarded as a great hardship, and much difficulty was experienced in its enforcement, notwithstanding the fact that everyone recognized its value. In a letter to the Maryland Board of Public Works, which controls the State fishery force, the commander of that force wrote, under date of December 31, 1890, in reference to the cull law, as follows:

> At the last session of the legislature a bill was prepared and introduced, under the direction of the governor, which provided for a system of culling, so as to have the young oysters left on the bars to furnish seed for a future supply, and this act is now about the only law which tends at all to relieve the bars from complete destruction. But the bill had a rider put upon it in the shape of an amendment that has about broken it down. The amendment provides for the ascertainment of the quantity of marketable oysters in a cargo by dumping 1 bushel in every 50, and in the end culling this "dump," finding the percentage of shells and small oysters, and deducting this percentage from the full cargo. This percentage is never taken out; but, on the contrary, goes into the bins of the packers as so much clear gain to them. By this section the packers are in position of greatest benefit when the oysters are not culled, as they get all the culls free, and these have, in some instances, amounted to 300 bushels in a cargo of 1,200 bushels. I find all classes to agree with me in saying that the cull law should be vigorously enforced, and all as unanimous in both violating it and trying to screen violators from arrest by the fishery force.

An attempt was made by act of 1892 (ch. 278) to remedy the defects in the regulation of this provision, and, as it can be effectively enforced only at the oyster markets, provision was made for the appointment by the governor of one inspector at each of the wholesale ports, whose duty it is to properly enforce the cull law in his respective district. Their compensation, limited to $600 per annum, was to be derived from the imposition of a tax of one-tenth of 1 cent per bushel on all oysters purchased by every wholesale or retail dealer. Many of the dealers, however, refused to pay this tax, alleging that it is irregular, and only about $2,500 was paid in 1892–93, notwithstanding the fact that 10,000,000 bushels of oysters were handled. But each year the

cull law is becoming more popular and better observed, and it is now considered more valuable as a protection to the common fishery than any other, if not all other oyster regulations of this State.

The total oyster product of Maryland during the present century, not including such as have been used for lime, etc., or those caught by citizens of other States, has probably amounted to about 395,000,000 bushels, for which the oystermen have received about $125,000,000, but the value of which after passing through the hands of the marketmen, transportation agencies, etc., has probably been $250,000,000 or more, over four times as great as the total present valuation of taxable property in all the counties from which the fishery is prosecuted, not including the city of Baltimore.

The largest catch during any one season was probably made in 1884–85, in which, according to the best estimates, the quantity obtained amounted to about 15,000,000 bushels. This large product was due to an excellent set obtained in 1883, the reefs in nearly all portions of the State being abundantly supplied. Judging from the records of a few oystermen and marketmen and from the number of men at work, as indicated by the license lists, there is reason to believe that the catch in 1874–75 was but little less than that of 1884–85, and, as the number of men oystering during that season was considerably less, the average catch per man was, of course, very much greater than in 1884–85.

During the seasons 1885–86 and 1888–89 large catches were made, probably falling little short of the foregoing. The season 1890–91 showed a large decrease in the quantity of oysters taken, the dredging fleet suffering most. The oysters were scarce and the prices high, the profits to both oystermen and marketmen being small. The decrease may have been to some extent due to the destruction effected by the great freshets in 1889. Those beds near the mouths of rivers draining large areas are reported as having exhibited the greatest depletion. The Virginia reefs were in fairly good condition, so that, taking the high prices into consideration, the oystermen of that State reported it as one of the most profitable seasons they had enjoyed for many years.

In 1891–92 the yield in Maryland was much better, the catch being 11,632,730 bushels, an increase of nearly 1,700,000 over the preceding season. This increased production was generally attributed to the effects of the cull law adopted in 1890 and the gradual recovery of the reefs from the destruction effected by the freshets of 1889.

In 1892–93, except that the dredging fleet again fared badly, the fishery seemed to be in much the same condition as during the previous season. The oysters were larger and fatter, but scarce. Up to December 31 the receipts at Baltimore were 3,022,170 bushels, as against 3,013,600 bushels in 1891–92 and 2,349,140 bushels in 1890–91. During January and February unusually cold weather prevailed in the Chesapeake region and the oyster fishery was almost stopped thereby. Thousands of boats and vessels were "frozen up" in the harbors and nearly all the shucking-houses were idle. The price for oysters in Baltimore ran up to $1.50 per bushel, this being higher than was ever before known at that port for standard-grade oysters. But as soon as the freeze was over the oystermen went to work and the season closed with a total catch of about 10,142,500 bushels, 1,490,230 bushels less than that of the preceding season.

THE OYSTER-GROUNDS.

Tidal-water areas.—By numerous acts of the general assembly the tidal-water areas of Maryland have been divided into two classes, viz, those situated within the small bays, sounds, rivers, and creeks, and known as the inshore or "county waters," and those areas located in the Chesapeake Bay and Potomac River outside of the smaller bays and rivers and designated in this report the "State waters." Of the 2,359 square miles * of tidal-water area of Maryland, 1,025 are situated within the limits of the counties, 976 in the Chesapeake Bay, and the remaining 358 square miles in the Potomac River, thus giving the "county waters" an area of 1,025 and the "State waters" 1,334 square miles.

The distinction between "county waters" and "State waters" is of much importance to those persons desirous of understanding the condition of affairs in Maryland, not only because different methods of oystering are prosecuted in each, but also because persons are not permitted to oyster in the waters of a county unless they are residents of that county, while citizens of any portion of the State may resort to the State grounds. The counties, however, have no title to the water area situated within their limits that would prevail against the State.

Tonging, dredging, and scraping constitute the various methods of catching oysters practiced in Maryland. Excepting a few reserved areas of small extent on which no form of oyster fishery is permitted, tonging is authorized under certain restrictions and regulations as to persons, times, and methods in all Maryland waters. Dredging is permitted in the "State waters" only, and the use of a few shoal reefs located therein is reserved from the dredgers for the use of the tongmen. Scraping, which is a modified form of dredging, is authorized only in portions of the waters of Somerset, Dorchester, and Talbot counties.

Thus, of the 1,334 square miles of "State waters," 35, containing some of the best oyster reefs, are reserved for the tongmen, leaving 1,299 for the dredgers. And of the 1,025 square miles of "county waters," 748 are reserved for the tongmen and 277 may be used by both tongmen and scrapemen. While the men using tongs are permitted under certain regulations to work on all the reefs in the State, yet the other methods of catching oysters are so much more successful that in most localities the permit is scarcely a privilege, and generally tongs are used only on reefs where dredges and scrapes may not be employed.

The location of the boundary lines separating the "State waters" from the "county waters" has occupied much of the time of the general assembly and of the courts of the State. The distinction between these waters originated in an act of 1830 (L. 1829–30, ch. 87), which prohibited citizens of one county from catching oysters within 300 yards of low-water mark of either shore of any river or bay situated within the limits of another county. The original distinction has been repeatedly modified and amended since then, both by general and local enactments, but it would require too much space to give here a history of the location of these boundaries, and the accompanying chart fully indicates them as they exist at present.

The following table exhibits in detail the tidal-water area of the State and the area on which each form of fishery may be prosecuted, the unit of measurement being the square statute mile. As tonging is authorized in all waters of the State, only such

* All miles referred to in this report are statute miles unless otherwise indicated.

areas are given under that caption as are exclusively reserved for that form of fishery. For purposes of comparison the land area of each of the 14 tide-water counties is noted in the last column.

Tidal-water area of Maryland and area on which each form of fishery is authorized.

Localities.	Tonging.	Scraping.	Dredging.	Total.	Land area.
County waters.	*Sq. miles.*	*Sq. miles.*	*Sq. miles.*	*Sq. miles.*	*Sq. miles.*
Somerset	71	112	.....	183	365
Wicomico	19	.....	.....	19	369
Dorchester	89	118	.....	207	610
Talbot*	73	47	.....	120	285
Queen Anne	64	.....	.....	64	352
Kent	50	.....	.....	50	315
Cecil	38	.....	.....	38	375
Harford	35	.....	.....	35	422
Baltimore	46	.....	.....	46	650
Anne Arundel	58	.....	.....	58	400
Calvert	29	.....	.....	29	218
St. Mary	54	.....	.....	54	360
Charles	21	.....	.....	21	460
Worcester	101	.....	.....	101	475
Total	748	277	.....	1,025	5,656
State waters.					.....
Chesapeake Bay	35	.....	941	976	.....
Potomac River	.....	.....	358	358	.....
Total	35	.....	1,299	1,334	.....
Grand total	783	277	1,299	2,359	.....

* Prior to November, 1893, the scrapemen licensed to oyster in the waters of Talbot County claimed and exercised a right in common with the dredgers licensed by the State to catch oysters lying along the west side of Talbot County, between Black Walnut Point and Tilghman Point and extending to the middle of Chesapeake Bay and Eastern Bay along said line, excepting the waters in Poplar Island Narrows reserved for the tongmen. A decision of the circuit court for Anne Arundel County, made in October, 1893, restricts them, however, to the waters lying between Wade Point and Tilghman Point. An appeal has been taken to the court of appeals, in which the decision of the Anne Arundel court will be reviewed. In the above table the conditions prevailing at the present time have been considered.

Natural reefs.—In the general acceptance of the term, natural oyster-ground is a place where oysters grow without special assistance from man and in sufficiently large quantities to induce the public to resort there for a living, but not a place where oysters have not during a term of years, usually accepted as ten, occurred in sufficient quantities to make it profitable to catch them, although they may there be planted and grown. The reason for so long a period of years is that occasionally, because of the fatalities of nature or on account of overfishing, certain areas may for several years be so impoverished that they can not be profitably worked, yet after a period of time they may, by the operations of nature, recover their former productiveness.

The locations of oyster reefs are determined by physical conditions—the salinity of the water, the character of the bottom, and the food resources, all exercising important influences in qualifying a locality for the growth of these mollusks. In four-fifths of the water area of Maryland the salinity of the water and the food resources are adapted to the growth of oysters, but under natural conditions only a portion of the bottom of this area is suitable to sustain them. Hence, in this State, the condition of the bottom is a more prominent factor in determining the adaptability of a locality to the support of oyster beds than the saline constituents of the water.

The oyster reefs at present existing in Maryland occur mainly on the sides of the channels in the Chesapeake Bay as well as its tributaries, and extend usually in the direction of the current. They are in greatest abundance at the mouths of estuaries

and in places where there are sudden changes in the depth of bottom, but are found in all depths of water from a few inches to 15 or more fathoms, and most plentifully where the depth is from 5 to 30 feet. The reefs extend in the Chesapeake Bay from the Virginia State line to Worton Point in Kent County, a distance of 110 miles; in the Potomac River from the mouth thereof to Maryland Point, in Charles County, a distance of 65 miles, and in the tributary bays and rivers as far up as salt water flows.

There are probably some oyster reefs in Maryland not yet known. The oystermen have no time to spend in search for them, and discoveries are made only by chance. Some of the known beds are not generally fished on, either because the oysters are too small, too much scattered, or because other and more accessible reefs produce the necessary supplies. Sometimes for a year or more a prominent reef is left almost untouched. Rarely in recent years have any of the oystermen resorted to the reefs situated about Pool Island and north of Swan Point. The large reefs lying off Smith Island and Kedges Strait were not generally worked prior to 1880. Many localities in Maryland which were formerly productive are now barren; on the contrary many places but recently barren are now producing in abundance. It was formerly stated that the Baltimore dredgers did "not know the way down the bay" in pleasantly referring to their obtaining the greater portion of their oysters above the Choptank River, while now the catch is obtained mostly from below that point.

It has been frequently stated in newspapers and other publications that the oyster beds of Maryland are practically exhausted. The product during the last few years does not indicate that this is the case, nor do the beds appear to be in extreme danger of soon becoming exhausted. It is astonishing that they have for many years yielded so abundantly and yet are in such good condition as at present. Nevertheless the reefs are undoubtedly being fished to their fullest productive capacity under present regulations, except possibly those situated in tonging areas, but too deep for utilization by those implements. Compared with the condition of thirty-five years ago the area of the reefs has been very largely increased, but because of the very vigorous fishery to which they have been subjected the size of the oysters brought to market is less and the number left on the beds at the end of each season has very materially diminished.

Occasional references are made to the former abundance of oysters around and even above Pool Island, where few are now caught, and to their occurring at the mouth of the Susquehanna River, where no oysters are now known to exist, as well as in many other places in the Chesapeake and tributaries, and their disappearance is popularly attributed to the extensive and vigorous fishery prosecuted in those waters. But the true cause for the greater part of this destruction is probably the changes in the quantity of fresh water flowing into the bay and the increased volume of the spring freshets. Forty years and more ago the farms along the tributaries of the Chesapeake were not so thoroughly cultivated as they are now, and the river and creek bottom lands were covered with timber. The more thorough cultivation of the farms, with the attendant system of ditching practiced in this section of the country and the clearing away of the timber, has caused a more rapid flow of the rain water and melted snow into the rivers and bays, which at times during the spring has freshened the water to a point beyond the endurance of the oysters. This is but one of the many adverse agencies with which oysters have to contend.

No complete survey has yet been made of the oyster reefs of the State of Maryland, in the absence of which the general understanding of the fishery can not be otherwise than imperfect and unsatisfactory, and very erroneous impressions exist as

to the extent, location, and condition of these reefs. In the attempt to supply to some extent this much-needed information, the writer, with the assistance of many persons engaged in the various branches of the oyster fishery and the able coöperation of Gen. Joseph B. Seth, sometime commander of the State fishery force, has ventured to approximate the area of the reefs known at present and to map their general location, the result of this work appearing in an appended table and on the chart accompanying this report.

The total area of natural oyster-ground as developed by this review approximates 355 square miles, 144 being situated in "State waters" and 211 square miles within "county waters"; but the total area covered with compact reefs probably does not exceed 135 square miles, the remaining part being more or less covered with scattered oysters.

In 1870 Mr. Hunter Davidson, then in command of the fishery force of the State, estimated the area of the natural oyster-ground to be 373 square miles. It must not be understood, however, because the present approximation is 18 square miles less than that made 23 years ago, that a decrease in the area of the reefs has actually occurred, for the contrary is probably the case, and the apparent error is either in one of the estimates or because he adopted a different definition for natural beds than that herein accepted. Persons familiar with the difficulties encountered in the survey of natural oyster-grounds can readily understand why these estimates should differ, if the same definition of natural oyster-grounds has been accepted. It is extremely difficult and almost impracticable to determine definitely and with accuracy the outlines and limits of the beds when the oysters are much scattered, as they frequently are on the outside borders of the bed, and arbitrary limits must be adopted. Should two thoroughly impartial and careful surveys be made, with suitable instruments, but a year apart, it is quite possible and even probable that a greater discrepancy would exist between them than is found in the present instance.

The Maryland oyster commission of 1884 approximated the area of the natural oyster-grounds at 193 square miles, not including the area situated within the Potomac River. But in their approximation the area in the Pocomoke and Tangier sound regions was estimated at 28 square miles, notwithstanding the fact that a careful survey of those grounds made in 1878 and 1879 by the U. S. Coast and Geodetic Survey disclosed the area to be at least 85 square (statute) miles. If this change be made in the figures for the Tangier and Pocomoke regions and the area of the beds in the Potomac River be added, it will give, according to the estimates of the Maryland commission, nearly 300 square miles as the area of the natural oyster-grounds of the State.

The following table exhibits in detail, according to the present approximation, the area in square miles of the natural oyster-ground and the area in which each form of fishery may be prosecuted. As tonging is authorized on all the natural reefs in the State, only such area is here presented under that caption as is exclusively reserved for that form of fishery. The percentage of natural beds in both the tonging and dredging areas is very much reduced by there being several hundred square miles of area in each in which the salinity of the water is not adapted to the growth of oysters. As scraping is authorized only in three of the most productive estuaries, the percentage is naturally much higher than where the other forms of fishery are prosecuted.

Natural oyster reefs of Maryland and area on which each form of fishery is authorized.

Localities.	Tonging.	Scraping.	Dredging.	Total.
County waters.	*Sq. miles.*	*Sq. miles.*	*Sq. miles.*	*Sq. miles.*
Somerset	20	39	.....	59
Wicomico	4	.....	.....	4
Dorchester	22	26	.....	48
Talbot	21	15	.....	36
Queen Anne	18	.....	.....	18
Kent	10	.....	.....	10
Anne Arundel	14	.....	.....	14
Calvert	6	.....	.....	6
St. Mary	11	.....	.....	11
Charles	2	.....	.....	2
Worcester	3	.....	.....	3
Total	131	80	.....	211
State waters.				
Chesapeake Bay	23	.....	79	102
Potomac River	.....	.....	42	42
Total	23	.....	121	144
Grand total	154	80	121	355

No data are at hand to exhibit the extent to which these beds are at present stocked with oysters. The method by which information of this nature has usually been obtained has been to dredge over the reefs and compare the number of oysters secured with the area over which the dredge has passed. It is not a satisfactory process, the quantity of oysters obtained thereby fluctuating according to the condition of the weather and bottom, the form and speed of the vessel, length of drag rope, construction and general manipulation of the dredge, and the ability and conscientious accuracy of the person conducting the examination; and under no circumstances does the dredge catch all the oysters in its path.

The report of the Maryland oyster commission of 1884 indicated as a result of their examinations in 1882 an average of 0.267 oysters to the square yard. But the catch during the following season is generally admitted to have amounted to at least 8,000,000 bushels or 2,000,000,000 oysters, an average of 1.89 oysters to the square yard, or according to the area of reefs as reported by that commission (193 miles), an average of 3.34. Probably less than 50 per cent of the number of oysters on the beds were caught during that season, indicating an average of at least 3.78 (or 6.68 if the area as reported by the Maryland commission be accepted) to the square yard. No recent examinations have been made for the entire bay to discover the number of oysters on the beds.

While this is an excellent method for learning the prospects of a good fishery during the ensuing season, yet the number of oysters on the reefs is so dependent upon seasonal conditions and the attachment of "sets" during the two preceding summers that unless the examination be continued over a period of years it is not of great value for determining the condition of the industry.

As will be seen on the accompanying chart, a very large portion of the oyster reefs in Maryland are situated on the Eastern Shore in the four great indentations, Tangier region, Choptank River, Eastern Bay, and Chester River. On the Western Shore the prominent oyster localities are the Potomac and Patuxent rivers, and the "Western Shore Bay grounds," or those on the western bank of the Chesapeake from Pool

Island to Point Lookout, including the Anne Arundel shore. The "Eastern Shore Bay grounds," which occur on the eastern bank of the Chesapeake, and the Sinepuxent or Chincoteague Bay grounds, located within the waters of Worcester County, complete the enumeration of the oyster-producing regions of the State.

These localities differ in physical characteristics and produce oysters in some respects peculiar to themselves, which are readily recognized in the markets and command varying prices; and while all, excepting the last named, are under the same general laws and regulations, certain local regulations affect each, and the industry in each differs to some extent from that of the others.

Tangier and Pocomoke regions.—Because of their having been resorted to more extensively and for a greater length of time, the oyster reefs of Tangier and Pocomoke sounds are better known than those of any other part of the State. It was there that dredges were first extensively used in Maryland, which, according to the most reliable accounts, was about the beginning of the present century. And after the interdiction of that form of oystering in Maryland in 1820, the use of those implements was permitted in a large portion of those sounds eleven years before they were authorized in the "State waters."

Tangier Sound extends north and south from the head of Fishing Bay to Watts Island, a distance of 40 miles, but only 32 miles of its length are situated within Maryland limits. Including its tributaries, Annemessex, Manokin, Wicomico, Nanticoke, and smaller streams, and all the "county waters" on the southern shore of Dorchester County, as well as the tributary channels, it covers within Maryland limits an area approximating 300 square miles, all of which is situated within the limits of Somerset, Wicomico, and Dorchester counties. The greatest recorded depth of water is 17 fathoms. In the channel it averages 9 fathoms and on the oyster beds it ranges from 3 to 40 feet. Almost throughout its length each side of the channel is lined with oyster reefs of greater or less extent. These reefs, somewhat scattered, extend through Hooper, Holland, and Kedges straits and between Smith and Tangier islands, as well as up the tributaries as far as the salinity of the water will permit. The area of the natural oyster-grounds in the Tangier region, including all the "county waters" on the southern shore of Dorchester, approximates 84 square miles, and the average annual product during the last five seasons was 3,400,000 bushels, valued at $1,625,000, this being an average of 40,476 bushels and $19,345 to the square mile. It is probable that fully three-fourths of this catch was obtained from the "solid reefs," which scarcely exceed 35 square miles in area, making an average product for that area of 72,857 bushels and $34,821 per square mile. From the origin of the fishery to the present time the total product of some areas situated in this region has doubtless exceeded 3,000,000 bushels of oysters to the square mile.

The Tangier oysters are ranked among the best obtained in Maryland. The shells are round and deep, but frequently exhibit the effects of the boring sponges. The oysters are usually fat, and many of them are marketed at fancy prices. The average size of those brought to market, however, is much less than it was twenty years ago.

Scraping is authorized in the open waters of this region within portions of Somerset and Dorchester counties, while the tributaries are reserved for the use of the tongmen. The area used by the scrapemen approximates 198 square miles and that reserved for the tongmen 102 square miles.

The Pocomoke Sound oysters differ little from those of Tangier Sound. Prior to

the establishment of the boundary line between Maryland and Virginia in 1877, the Maryland oystermen worked as far south as Watts Island; but by the award of the boundary commission of the year noted only about 23 square miles of the area of this sound was left within Maryland limits, all of which is situated within Somerset County. The area of the natural oyster-grounds in the Maryland portion of this sound approximates 8 square miles and the annual product is about 250,000 bushels, valued at $150,000. Tonging is the only form of fishery authorized, scraping having been interdicted in 1880. The reefs extend up the Pocomoke River a short distance beyond Old John Creek; while numerous, they are mostly of small area. In general the bottom is of mud, with sand or gravel near inshore. Apes Hole Creek, a tributary of this sound, is a favorite locality for the planting of oysters, a practice which prevails to a limited extent in certain parts of Maryland.

A right to oyster in common in the "Pocomoke River" exists between the citizens of Maryland and Virginia, this being admitted by both States. But a question exists as to where the river terminates and the sound begins. Citizens of Maryland claim that the mouth of the river is at the lower end of Sikes Island, but Virginians contend that it is at Williams Point, several miles above, and exercise exclusive jurisdiction to that point, leaving but a small area of reefs in common. Unfortunately this contention has not been without loss of life, and is still unsettled.

The following interesting statements were made by Lieut. Francis Winslow, in writing of the general condition of the oyster reefs of Tangier and Pocomoke sounds after making an examination in 1878 and 1879:

> The general opinion [among the oystermen] is that about twenty or twenty-five years ago, with the improved appliances in use at present, one-third more oysters could have been taken in the northern part of Tangier Sound than at present, from two to five times as many about Crisfield, and in Pocomoke Sound nearly seven times as many as at the present day; that without any of the modern contrivances it was possible then for either tongers or dredgers to take many more in a day than at present. The general opinion of all persons in or about the sounds, with a very few exceptions, is that the beds are being worked much beyond their capacity and the majority are in favor of extending the "close time" as a remedy for the deterioration. Many think that a resting time of a year or more would be beneficial.

After the writing of the foregoing the fishery in each of these sounds continued to decrease until 1884–85, when the excellent set obtained in 1883 enabled the oystermen to gather a rich harvest. During that season and the one following, tongmen made during some days from $8 to $12. But much destruction was effected by thousands of bushels of oysters, having from 1 to 50 young ones attached to each individual, being sold at the shucking-houses. The reefs yielded very well again in 1891–92, but during the last season the oysters have been less abundant.

Crisfield, Vienna, Whitehaven, Seaford (Delaware), and several smaller oyster-marketing ports, all combined utilizing annually about 1,600,000 bushels, derive their chief supply from this region.

Choptank River.—This river is situated within Dorchester and Talbot counties, and, together with its tributaries, covers an area of 165 square miles. The depth of water ranges from a few inches to 13 fathoms, and averages from 10 to 40 feet. The bottom is mainly hard yellow and gray sand, with occasional layers of blue mud and sometimes clay, only a small portion of it being soft. The area of natural oyster-grounds situated in this river and its tributaries approximates 40 square miles, on 18 square miles of which the use of scrapes is authorized, the remaining area being reserved exclusively for the tongmen.

The annual oyster product of the river and tributaries during the last five seasons has averaged about 1,750,000 bushels, for which the fishermen have received $740,000, an average of 43,750 bushels and $18,500 to the square mile. The average quantity per square mile obtained in this region is greater than that of any other locality in Maryland, but the average value of the product per square mile is surpassed by the yield in the Patuxent and Tangier regions. The Choptank oysters are much smaller than those from the Tangier region and are among the cheapest obtained in Maryland. Large quantities of them are transported north each spring for planting purposes; and it is reported that as late as 1879 vessels loaded with planting stock from this river at a cost not exceeding 5 cents per bushel, the oysters being, of course, unculled.

The citizens of Dorchester and Talbot counties enjoy the exclusive use of the Choptank River reefs in common, but those of the former county engage more extensively in oystering. The use of scrapes was first authorized in 1870, and since then a very great increase has taken place in the area of the oyster beds, and the shape of the oysters has become more uniform, rendering them more valuable from an economic standpoint.

Two large oyster-marketing ports, Cambridge and Oxford, utilizing annually about 600,000 and 300,000 bushels, respectively, are located on this river.

Eastern Bay.—Eastern Bay is situated largely within the counties of Talbot and Queen Anne, the remaining portion being a part of the "State waters." The area situated within "county waters" approximates 73 square miles; and, of that portion situated within the limits of Talbot County, about 7 square miles are utilized by a scraping fleet, the remaining area being reserved for tonging. The greatest depth of water is about 10 fathoms, the average being from 12 to 20 feet. The area more or less thickly covered with natural oyster-grounds, which are much scattered, is about 26 square miles. The average annual product of that portion within "county waters" is about 500,000 bushels, for which the oystermen receive about $250,000, an average of 19,230 bushels and $9,615 per square mile.

The Eastern Bay oysters are somewhat larger than the Choptanks and are sold at almost as high a price as the Tangiers. The only wholesale oyster ports on the shore of this bay are St. Michael and Claiborne, which handle annually about 225,000 and 35,000 bushels, respectively, nearly all the rest of the catch going to Baltimore.

Chester River.—This river, the northernmost and smallest of the four large coastal indentations on the Eastern Shore, is situated entirely within the counties of Kent and Queen Anne. The area approximates 68 square miles, being but little smaller than the "county water" area of Eastern Bay, and the area of the natural oyster-beds is about 17 square miles. While in one or two places in this river the depth of water is about 11 fathoms, few oyster-reefs exist where the depth is greater than 23 feet; or if they exist they are little known and are of no value, as tonging only is authorized.

As the oyster fishery in this estuary had not been sufficiently developed to warrant the use of dredges prior to the anti-dredging regulation of 1820, this form of oystering has never been legally prosecuted in these waters, but it has, during recent years, been a favorite locality for the operations of those dredgers willing to run risks in encroaching upon the areas reserved for the tongmen.

The annual oyster product of the Chester River approximates 450,000 bushels, for which the oystermen receive about $235,000, an average of 26,470 bushels and $13,823 for each square mile of reefs. There are no large wholesale oyster markets on the shores of this river and the catch is marketed mostly at Baltimore.

Patuxent River.—In the Patuxent River the oyster reefs extend from the mouth to the southern border of Prince George County, a distance of 24 miles. It is reported that 25 years ago the reefs extended much further up the river than at present, and fossil shells have been found 45 miles from the mouth of the river, but it is reported that no oysters are now caught along the shores of Prince George County, although a few were taken in 1885 and 1886.

The water in this river varies from a slight depth to 22 or more fathoms, the deepest water of the Chesapeake region occurring in this stream. Oysters are found in all depths wherever the bottom is suitable for their attachment. Dredging is not permitted in the Patuxent, and as the shaft tongs are not available for obtaining oysters from depths greater than 24 feet, a large number of "deep-water tongs" are in use here, since the introduction of which the annual product from this river has increased.

The water area of the Patuxent is about 46 square miles and the area of the natural oyster-grounds approximates 12 square miles, all of which are situated within the counties of Calvert, St. Mary, and Charles. The annual product of the reefs is about 500,000 bushels, for which the oystermen receive about $235,000, an average of 41,666 bushels and $19,583 to the square mile. The average value per square mile of the products from this river during the last five years has been greater than in any other tributary in the State, and the average quantity has been surpassed only by that from the Choptank River.

These oysters are usually large and fat and are marketed at a price fully equal to the average for the State, nearly all of them being sold in Baltimore at prices ranging from 10 to 15 cents more than received by the fishermen. The practice of "laying down" oysters to await a favorable market prevails here more extensively than in any other part of the Chesapeake.

Potomac River.—The oyster fishery in this river is more complicated and presents more intricate problems for solution than that of any other locality in the State. The Maryland-Virginia boundary line has for over two hundred years been a subject for dispute between the two States. In 1877 this was settled by a board of arbitration so far as the boundary along the Potomac River is concerned; and in accordance with this settlement the southern border of Maryland extends not merely to the middle of the channel of the river separating the two States, but to the extreme low-water mark on the Virginia side of the main body of the river and from headland to headland at the mouths of creeks along the same shore.

In 1785, while the boundary question was in dispute and before the adoption of the American Constitution, the States of Maryland and Virginia entered into articles of agreement for the regulation of commerce, navigation, and other industries of mutual interest. The fisheries were at that time of sufficient importance to receive consideration in this agreement, and one of the articles of the compact provided for a right of fishery in common to the citizens of the two States in the Potomac River and that in the regulation thereof neither State should enforce any law not approved by the other.*

* A condition somewhat similar exists in the English Channel outside of the 3-mile limit, in the once important oyster fishery prosecuted by fishermen from France and England. Ever since 1839 conventions acts have existed between those two countries regulating the fishery so far as the operations of their respective oystermen were concerned, but that fishery is prosecuted in the free sea, in which neither of those two countries has jurisdiction exclusive of others.

The situation at present is as follows: Both Maryland and Virginia oystermen pursue their calling in any and every part of the river that they may choose outside of the tributaries. Even though operating side by side, the Maryland oystermen are supposed to work in accordance with Maryland laws, and those of Virginia comply with the statutes of that State, this being in accordance with the convention act of 1884 (ch. 76), which is now operative. The one pays $3 per ton license fee and the other $1 per ton.* The one is expected to cull out and return all oysters under 2½ inches in length, while the other may take all he can catch, without regard to size. The result is that there is practically no culling regulation in the Potomac; and this has had a bad effect upon the enforcement of the cull law in other portions of Maryland. This condition of affairs in the Potomac constitutes a serious obstacle to the proper enforcement of the oyster laws of the State. The license laws and the close-season regulations, however, are very generally observed in the Potomac.

The area of this river from its mouth to the southern border of Prince George County is 358 square miles. In addition to this, the tributaries situated in the limits of St. Mary and Charles counties have an area of 37 and 21 square miles, respectively, in which only the tongmen of those respective counties are authorized to oyster, giving a total of 416 square miles. The area of oyster reefs approximates 42 square miles in the "State waters" and 7 in the tributaries situated within the "county waters." The average annual product of these reefs is about 1,600,000 bushels, valued at $700,000, of which about 500,000 bushels are obtained by the oystermen of Virginia. About 150,000 bushels of these oysters are annually marketed at Washington, D. C., but the majority are sold at Baltimore. From this river come the famous "Kettle Bottoms," the largest oysters produced in Maryland.

"*Bay-shore grounds.*"—The Bay-shore grounds are situated on each side of the Chesapeake Bay outside of the tributaries previously mentioned, and extend from Pool Island to the Potomac River on the Western Shore, and from Worton Point to Smith Island on the Eastern Shore. The reefs are found in all depths of water up to 45 feet, and are almost continuous along the shore, excepting in the northern portion of the bay, and in some places are 1½ miles in width. The total area of these reefs approximates 116 square miles, of which 14 are situated within the county limits of Anne Arundel, which, together with 23 square miles located about Tally Point, Sandy Point, Hackett Point, Thomas Point, Holland Island Bar, Swan Point Bar, Plum Point, and Poplar Island, are reserved for the tongmen, leaving 79 square miles for the use of the dredgers. The annual product from these grounds during the last five seasons has averaged about 3,025,000 bushels, valued at $1,522,000, of which about 1,850,000 bushels, valued at $940,000, were obtained by the dredgers, and 1,175,000 bushels, valued at $582,500, by the tongmen.

The oysters obtained from these reefs, particularly those caught by dredges from the Anne Arundel shore to Point Lookout, are among the finest in Maryland, and are usually sold at the highest market price, being nearly always large and fat. The product from the bay shores has fluctuated very much during the last eight years, during some seasons the quantity obtained being almost twice that of the succeeding year. This was true of the seasons 1888–89 and 1889–90, and the quantity obtained since the former season has been very light compared with the extent previously. Because of the depth of water and the extent of the area along the bay shores, the

* The dredging license fee in Virginia is 50 cents per ton per month, but vessels in that State usually dredge only about two months each season.

probabilities are greater for the discovery of new reefs there than in other parts of Maryland. Every few years new reefs of small extent are discovered and added to the productive area.

Sinepuxent oyster-grounds.—These grounds are situated on the ocean side of the State and within the limits of Worcester County. At present their area does not exceed 3 square miles, the annual product of which during recent years has averaged about 75,000 bushels. These oysters are rather small and are used mostly for planting purposes, nearly all of them being again bedded on the private areas in that county. At one time this bay was one of the important oyster-producing regions of Maryland, but at present the percentage of natural reefs to the total water area is less than in any other oyster-producing county in the State, being only about 3 per cent. The conditions of the oyster fishery in this county are totally different from those in the other counties in Maryland, no part of the regulations of the oyster industry of the Chesapeake Bay and tributaries applying to the waters of the Sinepuxent Bay.

The history of the fishery here is unique and interesting. Dredges have never been used to any noticeable extent, if at all. From 1820 to 1844 the oysters were so abundant that many persons engaged in catching them to be burned into lime, which sold at from 4 to 8 cents per bushel. At present the only outlet into the ocean possessed by this bay is through Chincoteague Inlet, at the extreme lower end of Chincoteague Bay. But during the period mentioned another and more convenient outlet existed. This was closed by natural causes about 1844, and the water in the bay gradually became so fresh and the bottom so covered with vegetable growth that the oysters were almost entirely destroyed except in the most favorable localities. Many efforts were made to retard the decrease by restricting the fishery. In 1846 a close time was established in the county from April 13 to September 1. In 1852 the removal of empty shells from the reefs for any purpose whatever was prohibited, and in 1861 it was required that only 10 bushels of oysters should be taken in any one week by each man, but this provision was operative only one year.

The great scarcity continued until 1868, when a severe storm occurred in this region, producing an inlet in a narrow portion of the sand beach. The ocean water also flowed over the beach in other places and raised the water in the bay several feet, thus thoroughly scouring the bay by reason of its being very shallow. During the year following the one in which the storm occurred an excellent set of oysters was obtained. At the end of two years these were marketable and hundreds of persons were employed in tonging them, some making at times as much as $100 and over per week. Difficulty was experienced in obtaining farm hands all along the shores of the bay because of the great number employed in catching oysters. The carpenters left houses unfinished, the farmers their fields, and the country merchants their counters, to engage in obtaining a share of the bountiful harvest. It is probable that during some of the years following 1870 the product of the common fishery in this bay amounted to 800,000 or more bushels, ranging in value from 50 cents to $1 per bushel. At one time in 1872 over 40 vessels loading for northern markets were counted within sight of one point in the bay.

But the inlet made by the storm closed up and the oysters gradually decreased in abundance. From 1881 to 1884 the oysters were again somewhat plentiful, but not by any means so abundant as in 1872. Since 1884 the quantity obtained annually from the public reefs has been small, the extensive trade now prosecuted in that bay being dependent on the planting business, which has been conducted there more

or less extensively since 1842. It seems probable that the opening of a new outlet for Sinepuxent Bay, which is now in contemplation, will have a beneficial effect on the productiveness of the natural oyster reefs.

The data relative to the area and average annual product of these various localities during the last five seasons are here summarized:

Localities.	Area.	Average annual product.		Average product per square mile.	
	Square miles.	Bushels.	Value.	Bushels.	Value.
Pocomoke Sound	8	250,000	$150,000	31,250	$18,750
Tangier region	84	3,400,000	1,625,000	40,476	19,345
Choptank region	40	1,750,000	740,000	43,750	18,500
Eastern Bay	26	500,000	250,000	19,230	9,615
Chester River	17	450,000	235,000	26,470	13,823
Patuxent River	12	500,000	235,000	41,666	19,583
Potomac River	49	*1,600,000	700,000	32,653	14,285
Bay shores	116	3,025,000	1,522,500	26,077	13,120
Sinepuxent Bay	3	†75,000	43,500	25,000	14,500
Total	355	*11,550,000	5,501,000	.....	.....
Average	.....	.....	.....	32,535	15,495

*500,000 bushels obtained by Virginia oystermen.

† In addition to this, 96,000 bushels, valued at $87,500, were marketed from the private areas in this bay.

Of this oyster product, 4,850,000 bushels were obtained from tonging areas, 2,950,000 from dredging areas, and 3,250,000 bushels from scraping areas, not including the catch by Virginia oystermen. About 500,000 bushels of the above-mentioned catch on scraping-grounds were obtained by dredging-vessels working temporarily under a scraping license.

TONGING.

Historical notes.—During the early history of the industry in Maryland citizens of any county were permitted at their pleasure and without restriction to tong oysters in any waters situated within the State. While this branch of the fishery has continued uninterruptedly from the origin of the industry until the present date, the places, times, and methods of its prosecution have been frequently modified.

When the oystermen of 1820 were so much alarmed at a temporary decrease in the productiveness of the reefs that they interdicted in any part of the State the use of dredges, an increase naturally followed in the number of tongs employed. The apparent decrease in the productiveness of the reefs continuing, the general assembly enacted in 1830 (L. 1829–30, ch. 87) that the use of these implements having more than six teeth on a side should be prohibited, except in the deep waters of the Chesapeake Bay. But at the same session this act was repealed so far as it affected the waters of the Eastern Shore of the State (L. 1829–30, ch. 58), the restrictions against their use on the Western Shore remaining operative until 1834, although some difficulty was experienced in enforcing it during the two or three years immediately preceding its repeal.

The enactments of 1829–30 (ch. 87) and 1835–36 (ch. 260) making a distinction between "county waters" and "State waters," and prohibiting the citizens of one county from oystering in the waters of another county, affected to some extent the tonging industry by confining it closely to those counties having extensive reefs within their limits.

By act of 1845–46 (ch. 240) it was made unlawful for any person thereafter to tong oysters in the waters of Worcester County between April 13 and September 1 of any year, this being the first close season operative in any part of Maryland. In 1861 (ch. 57) this local close season was changed to May 1–September 1; and it was further required that before any person should engage in tonging in the said county he should obtain a written permit from all the acting justices of the peace in the district bordering Sinepuxent Bay, said permit to expire on April 30, annually, and to limit the quantity of oysters to be taken by any one man to 10 bushels per week; but at the following session this act was repealed (L. 1861–62, ch. 48).

As tonging was the only method of catching oysters authorized from 1820 to 1854, the development in extent of this branch of the fishery is practically represented by the statistics of the early oyster industry as herein presented.

The license system adopted in 1865 modified all tonging regulations and required, under a penalty of from $20 to $100, that before any person should engage in tonging oysters he should obtain from the clerk of the circuit court of the county of which he was a resident, and at a cost of $5, a license for each boat employed, the proceeds from the issuing of such licenses being paid into the treasury of the State. The license authorized the use of tongs from June 1 in any year to June 1 following and was to be renewed annually. It was further required that each boat licensed should be so numbered as to be readily identified.

During 1865–66, the first season in which this act was operative, 1,658 boats were licensed, the amount of revenue derived by the State therefrom being $8,290, and the estimated quantity of oysters taken by these implements amounted to about 1,250,000 bushels.

At the next session of the general assembly (L. 1867, ch. 184) the license fee for tonging was reduced from $5 to $4 per boat; and in 1868 (L. 1868, ch. 406) a graded rate was substituted as follows: Boats measuring 20 feet or less in length, $4; from 20 to 25 feet, $6; from 25 to 30 feet, $8; and all over 30 feet, $10 each. But in 1872 (ch. 167) the general fee was again changed, being reduced to exactly one-half of the preceding rates, and the new rates remained operative until 1892.

A report relative to the extent of the tonging industry, made in 1870 by the commander of the fishery force, shows that in the season 1868–69 the number of boats licensed to tong was 1,907, and the catch amounted to 1,735,370 bushels, for which the oystermen received $607,380; and a similar report, made by the same officer in 1871, shows that in the season 1869–70 the number of boats was 1,647, the number of men operating them was 3,410, and the catch amounted to 2,043,075 bushels, valued at $715,076. From 1870 until 1875 this branch of the oyster industry was very prosperous and good prices prevailed, the number of boats employed in 1872–73 being 950 more than in 1869–70. But following 1875 there was a large decrease in the extent of the fishery, both the quantity and value of the products being reduced. In the meanwhile the legal seasons and the methods of fishery were further restricted, the following being the more important of the regulations adopted:

In 1870 (ch. 364) it was required that no license to take oysters with tongs should be issued in any part of the State to any boat or vessel licensed to catch oysters with dredges, scrapes, or similar instruments. Prior to this enactment a number of boats obtained both dredging and tonging licenses with the purpose of using the dredges on areas on which those implements were unauthorized, it being difficult to prove,

even when a boat was apprehended on interdicted areas with wet oysters, that the same were not obtained by means of tongs.

By act of 1872 (ch. 241) it was made unlawful for any person to remove oysters from the limits of Wicomico County between May 15 and September 1 of each year, and at the same session a new close season was established on the natural reefs in Worcester County, this time from June 1 to September 15 of each year, but the act requiring the tongmen in this county to obtain license was at the same time repealed. But in 1874 (ch. 77) the tongmen of Worcester were again required to obtain licenses, the rate being fixed at $3 per man, which in 1876 was reduced to $1 per man, the revenue derived therefrom to be expended by the county commissioners in the purchase of seed oysters to be planted in the waters of that county. This act also changed the close season on the natural reefs in Worcester from June 1–September 15 to May 1–October 1 of each year; but this was again changed in 1880 to May 1–September 1, this being the present close season operative in that county.

By act of 1874 (ch. 181) persons were prohibited from tonging oysters except for private use, or for the purpose of replanting or bedding in the State, or for sale to citizens of the county wherein they are caught or of the county next adjoining, between May 1 and September 1 in each year, this being the first attempt at establishing a general close time on this branch of the industry. This act also required that all fees derived from issuing tonging licenses, except in Worcester County, should be devoted to the public schools of the respective counties wherein the licenses were issued, the sum received from white owners of licensed boats going to the support of the white schools and the sum from the colored owners to the colored schools.

In 1880 (ch. 198) the general close time was increased fifteen days, being changed to April 15–September 1. As the close time established in 1874 did not interdict the taking of oysters for sale in the county where caught or in the adjoining county, the close time provided for in 1880 was practically the first general one operative on the tonging branch of the fishery. But this act permitted the taking of oysters during the interdicted time in quantities not exceeding 5 bushels per day for private use or for planting purposes, and when the courts were called upon to interpret this provision they rendered decisions permitting the taking of unlimited quantities, so that the provision was effective only during a portion of one season. The proper remedy, however, was applied at the next session of the general assembly, and in 1886 (ch. 296) the length of the general close time was decreased for the first time since the adoption of the system, being changed from April 15–September 1 to April 24–September 1.

Before the enforcement of the general close season on tonging, the men engaged in this fishery had a great advantage in the privilege to catch and bed oysters during the summer months and thus have a supply on hand for the winter markets. This privilege, however, was little appreciated and few persons took advantage of it.

About this time there was introduced in Maryland an apparatus for catching oysters, commonly called "deep-water tongs," of which there are a number of varieties. They all differ from the ordinary tongs in being much larger and heavier and have no shafts, being lifted by means of ropes and winders. They are much more injurious to the reefs than the ordinary tongs, but are employed with much success in places having too great a depth of water to permit the use of shaft tongs, the latter being the more effective implements in depths less than 24 feet. In 1888 (ch. 394) the use of these implements was prohibited in the waters of Talbot, Queen Anne, Dorchester, and

Anne Arundel counties, but numbers of them are yet employed in Calvert, St. Mary, and Somerset counties.

In 1890 (ch. 333) an act local to Talbot, Queen Anne, and Kent counties was passed, providing that in those counties each man engaged in tonging or culling should be licensed, and not the boat, as was formerly the case, the fee being placed at $4 per man. The licensing of the tongmen instead of the boats had been practiced in Worcester County since 1874. This method worked so well in the three counties named, both in increasing the revenue and in enforcing the regulations of the fishery, that in 1892 (ch. 278) it was applied to all the counties of the State except Worcester, which retained its local license system of 1874.

The new license fee was placed at $3.50 for each person engaged either in tonging or culling, of which 50 cents should go to the clerk of the circuit court by whom the license was issued, 30 cents to the oyster fund of the State, and the remaining $2.70 to the public schools of the county in which the license was granted; provided that boys under 15 years of age should not be required to obtain license, and that the county commissioners of any county should be authorized to give special permission to any women who have no visible means of support to take and catch oysters without further license. It must not be understood from the last-mentioned provision that a large number of women engage in tonging oysters in Maryland. On the contrary, there are not more than two or three in the entire State, and no special demand existed for this exception to the license regulations. The number of "boys under 15 years of age" employed on the tonging boats is quite large, there probably being an average of one to every six men. The boys cull the oysters as they are tonged; this work is quite light and easily performed, except in cold or rough weather.

The effect in the change in the license system and rate has been to double the revenue derived therefrom, as will be observed from the following table exhibiting by counties the revenue from this source during each of the last five seasons. The full effect is observed by comparing the total revenue in 1888–89 or 1889–90 with that in 1892–93, the seasons 1890–91 and 1891–92 not presenting a proper comparison, as the new system was then operative in only three counties, viz, Talbot, Queen Anne, and Kent. This great increase in the revenue has been effected notwithstanding a decrease in the number of men engaged in this branch of the fishery.

Table exhibiting by counties the revenue received during the last five seasons from issuing tonging licenses.

Counties.	1888–89.	1889–90.	1890–91.	1891–92.	1892–93.	Total.
Somerset	$577.00	$560.00	$1,158.00	$1,140.00	$1,911.00	$5,346.50
Wicomico	1,301.00	1,360.00	1,399.00	1,530.00	2,271.50	7,861.50
Dorchester	2,835.00	3,694.00	3,306.00	2,799.00	5,596.50	18,230.50
Talbot	1,626.00	1,861.00	4,948.00	2,908.00	4,196.50	15,539.50
Queen Anne	868.00	1,129.00	4,148.00	4,256.00	3,286.50	13,687.50
Kent	941.50	1,091.00	3,076.00	3,688.00	3,593.50	12,390.00
Anne Arundel	1,926.00	1,931.00	2,140.00	1,953.00	3,895.50	11,845.50
Calvert	1,527.00	1,666.00	1,863.00	1,891.00	2,828.00	9,775.00
St. Mary	1,638.00	1,828.00	2,180.00	2,192.00	3,944.50	11,782.50
Charles	462.00	476.00	542.00	431.00	658.00	2,569.00
Worcester*	110.00	145.00	183.00	100.00	172.00	710.00
Total	13,811.50	15,741.00	24,943.00	22,888.00	32,353.50	109,737.50

*License system unaffected by the general law.

By the aforementioned act of 1892 the general close time on tonging was changed from April 21–September 1 to April 21–September 14. This increase in the length of the close season has been beneficial chiefly to the agricultural interests of the counties bordering the bay, due to the fact that an early opening of the oyster season makes it difficult to obtain laborers to assist in harvesting the farm produce. The following table exhibits in a condensed form the various general close times operative in the tonging branch of the oyster fishery since the adoption of the first one in 1874:

Years operative.	Close time.
1874–1879	May 1–Sept. 1.
1880–1885	Apr. 15–Sept. 1.
1886–1889	Apr. 24–Sept. 1.
1890–91	Apr. 21–Sept. 1.
1892–	Apr. 21–Sept. 14.

In addition to the general close seasons, certain localities have had local close times differing therefrom as follows:

Localities.	Years operative.	Close time.
Worcester County	1846–1860	Apr. 13–Sept. 1.
	1861	May 1–Sept. 1.
	1862–1871	Apr. 13–Sept. 1.
	1872–1873	June 1–Sept. 15.
	1874–1879	May 1–Oct. 1.
	1880–	May 1–Sept. 1.
Wicomico County	1872–1879	May 15–Sept. 1.
	1880–1885	May 1–Sept. 30.
	1886–	Apr. 15–Sept. 30.
Patuxent River	1870–1872	Apr. 20–Oct. 10.
Potomac River	1880–1884	Apr. 1–Aug. 31.
	1884–	Apr. 15–Aug. 31.

The present regulations respecting the licensing of tongmen are as follows:

Any resident of this State desiring to catch or take 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 for the county wherein he may reside, a license therefor, and such license shall have effect from the fifteenth day of September in any year in which it may have been obtained to the twentieth day of April, inclusive, next succeeding; provided that such license shall not authorize the taking or catching of 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 the 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 Queen Anne and Kent counties from using the waters of the Chester River in common, or the citizens of Dorchester and Wicomico counties from using the waters of 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 the citizens of Dorchester and Talbot counties from using the waters of the Choptank River in common. Provided, however, that the county commissioners shall be authorized to give special permission to any woman who has no visible means of support to take and catch oysters without license. Provided also, that boys under fifteen years of age shall not be required to license.

Each and every license to take or catch oysters for sale, with rakes or tongs, shall state the name, age, and residence of the person to whom the same is to be granted, the number, and the county in which the same is to be used, and every applicant for such license shall pay to the clerk of the court when such license may be granted and before the issuing and delivery of the same, the sum of $3, and also the sum of 50 cents as a fee to the clerk for issuing the same. Nine-tenths of the amount received from tonging licenses shall be paid by the clerk to the school commissioners for the public schools in the respective counties where such licenses are issued; the sum received from white tongers to go to the white schools, and the sum received from the colored tongers to go to the colored schools.

Every applicant for license to take or catch 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 twelve months next preceding his application for said license; that he desires and intends to use said license in the county in which he resides, or the waters used in common, as hereinbefore provided in this article, and that he will comply with and obey all the laws of this State regulating the taking or catching of oysters.

The comptroller of the treasury shall cause to be printed and delivered to the clerk of the circuit courts for the several counties the requisite number of such blank licenses and take receipts for the same as for other licenses furnished; and said clerk shall, on the first Monday of March and December of each year, return to the comptroller a list and account of such licenses issued by them, and at the end of each tonging season shall return all unused licenses to him, and shall pay over to the comptroller one-tenth of the amount received by him for such licenses, which amount the said comptroller shall place to the credit of the "oyster fund;" and no license to take or catch oysters with rake or tong shall be used on any boat or vessel which is licensed to take or catch oysters with scoop, drag, dredge, or similar instrument, during the season for which such boat or vessel is licensed, and all licenses shall expire at the end of the season.

If any person shall use any canoe or boat not licensed as required by the preceding sections of this article in taking or catching oysters with rakes or tongs, he shall, upon conviction thereof before a justice of the peace for the county wherein the offense has been committed, be fined not less than $20 nor more than $100; and in case of refusing to pay the said fine, said party shall be confined in the house of correction for a period of not less than three months nor more than one year, and in any such case the boat or vessel shall be forfeited, and may be condemned, in the discretion of the judge or justice of the peace.

Making a careful calculation, it is found that the total product of the tonging branch of the common fishery since the beginning of the present century, not including the small stock used for lime or fertilizing purposes or those obtained by the citizens of other States, approximates 160,000,000 bushels, for which the tongmen have received about $47,000,000. Of this amount the estimated product since the adoption of the license system in 1865 is 100,000,000 bushels, valued at $32,000,000, leaving 60,000,000, valued at $15,000,000, as the catch from 1801 to 1864. The largest catch by means of tongs during any one season was doubtless in 1884–85, when 4,741 boats were licensed in the Chesapeake region alone, the product, according to the best estimates, amounting to about 6,500,000 bushels, valued at $2,375,000. But as the number of men oystering during that season was greater than ever before or since, the average catch per man was very much less than during some previous years.

The total revenue derived from the issuing of tonging licenses since 1865 and to the close of the fiscal year 1893 amounts to $319,175.65; of this sum $173,316.50 has been received during the last ten years and $109,737.50 during the last five years.

The following table exhibits the number of tonging licenses issued in each of the counties up to present date. It is proper to state that during certain seasons since 1876 many of the tongmen of Somerset County have refused to license. This has been due chiefly to the contention as to the right of oystering in common with the citizens of Virginia in the Pocomoke, and the Somerset tongmen, when feeling themselves especially aggrieved, have refused to pay the license fees.

Table showing the number of tonging licenses issued in Maryland during each season since 1865.

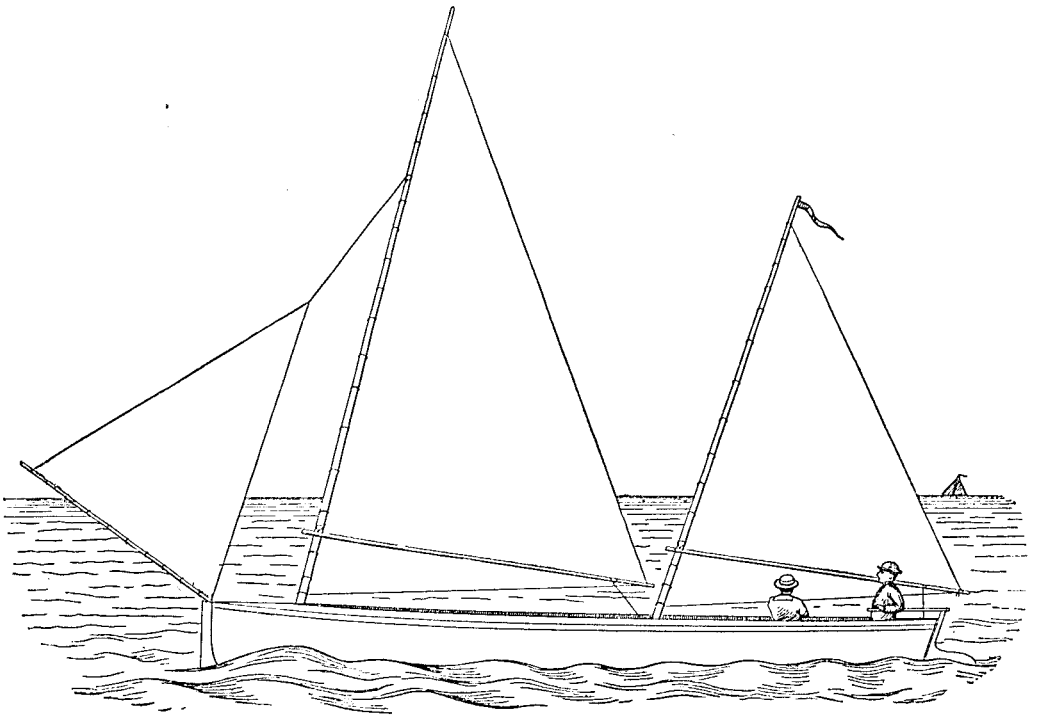
[Figures in bold-face type indicate that licenses were issued to the men, in other instances the boats were licensed.]

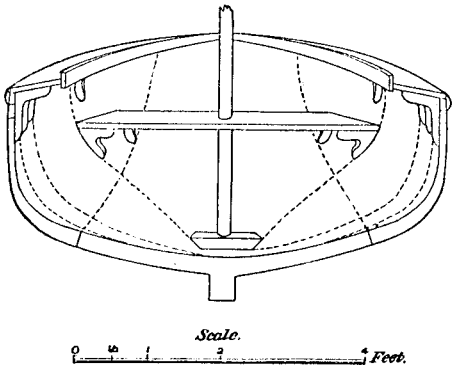
Years.	Somerset.	Wicomico.	Dorchester.	Talbot.	Queen Anne.	Kent.	Anne Arundel.	Calvert.	St. Mary.	Charles.	Worcester.	Total number of boats.	Total number of men.
1865-66.....	267	89	243	212	116	117	162	139	229	19	65	1,658	.....
1866-67.....	263	86	251	234	103	98	193	157	220	15	64	1,684	.....
1867-68.....	234	92	220	241	146	84	218	183	284	21	80	1,803	.....
1868-69.....	246	110	257	246	105	93	222	189	336	22	81	1,907	.....
1869-70.....	128	115	210	202	67	77	223	180	309	16	120	1,647	.....
1870-71.....	178	112	331	199	115	103	234	145	267	8	(*)	1,692	.....
1871-72.....	252	106	441	184	119	96	240	146	220	12	(*)	1,816	.....
1872-73.....	245	195	575	274	178	95	300	324	362	48	(*)	2,596	.....
1873-74.....	125	125	405	280	183	109	421	380	307	22	(*)	2,357	.....
1874-75.....	329	172	472	294	210	120	314	237	325	50	**291**	2,523	**291**
1875-76.....	239	98	280	276	172	101	396	207	272	49	**241**	2,090	**241**
1876-77.....	72	88	212	254	146	101	250	186	244	28	**193**	1,581	**193**
1877-78.....	59	133	182	217	139	106	348	198	197	23	**170**	1,602	**170**
1878-79.....	2	108	142	258	144	122	343	243	212	30	**211**	1,604	**211**
1879-80.....	2	134	199	281	145	123	301	312	183	41	**106**	1,721	**106**
1880-81.....	37	173	291	386	391	137	310	306	297	101	**237**	2,429	**237**
1881-82.....	17	171	317	371	389	114	342	314	350	118	**360**	2,503	**360**
1882-83.....	25	197	353	294	511	138	364	269	386	93	**333**	2,630	**333**
1883-84.....	106	183	387	260	501	181	358	259	366	180	**336**	2,781	**336**
1884-85.....	756	296	696	457	648	250	407	392	663	176	**153**	4,741	**153**
1885-86.....	536	300	736	453	263	267	456	367	618	136	**62**	4,132	**62**
1886-87.....	317	344	742	430	248	245	472	317	610	130	**97**	3,855	**97**
1887-88.....	207	340	839	450	251	262	512	359	582	112	**126**	3,914	**126**
1888-89.....	191	289	861	490	284	267	560	423	558	132	**110**	4,055	**110**
1889-90.....	176	297	948	559	364	316	607	461	626	136	**145**	4,490	**145**
1890-91.....	355	304	1,003	**1,237**	**1,112**	**769**	650	521	757	155	**183**	3,745	**3,301**
1891-92.....	330	333	933	**727**	**1,064**	**862**	615	531	759	122	**100**	3,623	**2,753**
1892-93.....	**546**	**649**	**1,599**	**1,199**	**939**	**741**	**1,113**	**808**	**1,127**	**188**	**172**	.....	**9,081**

*Tongmen exempt from license system.

Area and location of grounds.—The water area within the county limits of Maryland approximates 1,025 square miles. Tonging is permitted on all of this area except certain small places reserved for private use, yet as scraping is authorized in Somerset, Dorchester, and Talbot counties on 112, 118, and 47 square miles, respectively, and as the tongmen do not usually work on grounds frequented by men using more effective apparatus, only 748 square miles of water area are devoted exclusively to their use. Of this the area more or less covered with natural oyster reefs approximates 131 square miles. Of the 1,334 square miles of "State grounds," 35 square miles containing some of the best reefs are reserved for the tongmen, 23 miles of this area being covered with natural reefs. This gives a total of 154 square miles of oyster beds on which tonging alone is authorized. The average annual product from this area during the last five seasons has approximated 4,850,000 bushels, for which the oystermen have received $2,200,000, an average of 31,493 bushels and $14,269 to the square mile.

The reefs situated within the tonging areas are usually smaller in extent and not so continuous as those in the dredging and scraping areas. The ground is not so level, the oysters occurring more in heaps. These reefs are located principally along the Anne Arundel shore, in the Patuxent River, Chester River, Eastern Bay, and the small tributary waters of Choptank River and Tangier Sound. They are all close in shore where the water is shallow, usually not exceeding 26 feet in depth, and averaging from 10 to 22 feet. In a few localities, however, as in the Patuxent River, much greater depths are found; but in those places a form of tongs suitable for deep water is employed to some extent.





CHESAPEAKE BAY CANOE.

As the tonging reefs are situated in the inshore waters, where the dredging vessels harbor at night, and in the mouths of rivers and inlets directly in the path of navigation, the opportunities for dredging thereon without detection are great. On account of the exposed position of the dredging-grounds, situated in the deep waters off shore, the rough weather prevalent during the latter half of the oyster season prevents the dredging vessels from working more than three or four days in the week, and when not able to dredge they seek shelter in the coves and rivers with every temptation to take the oysters directly under them, resulting in the tonging reefs being not entirely free from their depredations. And at times, during periods of scarcity on the "State grounds," certain "county grounds" have been openly and defiantly used by the dredgers, this being particularly noticeable in 1888 and 1889. However, these occurrences are not so common as is generally supposed, and during the last three or four years the quantity of oysters taken in this manner has probably not been very large. It is proper to state that Maryland's experience with the difficulties encountered in protecting reserved areas has not been peculiar, nearly all the extensive oyster-producing localities having suffered in this respect.

Boats and apparatus.—Tonging is prosecuted with many forms of boats varying in size from 45 feet in length to such as are scarcely sufficient to float one man with a few bushels of oysters. The principal forms of craft employed are canoes, skiffs, bateaux, brogans, and sloops. These are built mostly on the shores of the Chesapeake and tributaries, the greater number being constructed by the oystermen who use them. Canoes are by far the most plentiful, and in some parts of Maryland the words canoe and tonging boat are synonymous. In the early part of the present century, because of the cheapness of its manufacture, this was almost the only type of boat employed by the people of Maryland in the oyster industry; and they had been in extensive use by the Indians before the settlement of the State. In reference to the canoes observed on the occasion of his visit to the Chesapeake Bay in 1609, John Smith says, in his well-known "Travels and Adventures":

> Their fishing is much in Boats. These they make of one tree, by burning and scratching away the coales with stones and shels till they have it in forme of a Trough. Some of them are an eln deep and fortie or fiftie foot in length, and some will beare 40 men, but the most ordinary are smaller, and will beare 10, 20, or 30, according to their bignesse. Instead of Oares, they use Paddles and sticks, with which they will row faster than our Barges.

Canoes were originally made of pitch pine from a single log and were straight in the bow and pointed at both ends. The average size at present is about 20 feet in length, 4 feet wide across the gunwales, and 18 inches deep on the inside. Formerly large ones, 30 feet and more in length and 5 or 6 feet wide, were also made from one log. But as the number of large pitch-pine trees decreased, the size of the canoes was necessarily lessened. This finally led to the use of three, five, and seven logs in one boat, the different logs being joined to each other by wooden keys or iron bolts driven in edgewise. When three logs are used one forms the keel and the others form the sides. The large canoes generally have a short length of decking in the bow and sometimes a small house and usually a centerboard. The smaller ones carry only one mast with a triangular sail; the larger ones have two masts with triangular sails and sometimes a jib. The cost of these canoes ranges from $60 to $600 each. Some of them last a very great length of time. The *Martha Washington*, 10.84 tons, was built in 1827 and is still doing service. The dimensions of this vessel are: length, 39 feet; breadth, 13.5 feet; depth, 4.8 feet. The number of skiffs, bateaux, brogans, and

sloops employed in tonging is not large; and as these boats are not peculiar to the oyster industry of the Chesapeake, but are of the same type as employed in the fisheries of other localities, a description of them is unnecessary in this connection.

The average number of vessels and boats employed in tonging during the last five seasons has been about 5,000, with a total valuation of $410,000. Of these, 60, valued at $30,000, measure over 5 tons. Generally the tonging boats are owned by the men using them; but in some instances a large number are owned by oyster marketmen and others who hire them at so much per day to the fishermen. The license system of 1892 has had a beneficial effect in encouraging the tongmen to own their boats. The oyster regulations do not authorize the issuing of tonging licenses to those boats having a scraping or dredging license.

The tongs used in Maryland are probably larger than those employed elsewhere in America, excepting in the adjoining State, Virginia. They have from ten to eighteen teeth on each side and the shafts are from 12 to 28 feet in length. The large ones are sometimes improperly designated "rakes." The tongs hold from one-half peck to three-fourths of a bushel of material, but as a large quantity of the rubbish of the oyster beds is also taken up at the same time, the number of oysters obtained at each lift is usually very much smaller.

In the limits of Somerset, Calvert, and St. Mary counties, and along the bay shores, a number of "deep-water tongs" are employed. These have no shafts, but are much like two dredges joined together as shaft tongs are. They are hauled by ropes, the labor being generally lightened by the use of a small winder attached to the mast. These implements have been employed to a large extent only about eight years.

The tongmen.—The crew of a boat engaged in tonging consists of from one to three persons, one of whom is frequently a boy, whose duty it is to attend to the culling, throwing the shells and small oysters back into the water. The total number of persons employed in this branch of the oyster fishery during the last five years has averaged about 11,000, of whom about 1,500 were boys. Usually the men in one boat work on shares, while the boys are employed on wages varying from 50 cents to $1.25 per day. One effect of the present or "1892 license regulation" has been to decrease the average number of persons tonging from one boat and to increase the number of boys employed in the fishery.

The tongmen live near the shores adjacent to the reefs and are all citizens of Maryland, non-residents not being permitted to engage in this branch of the fishery. They are also mostly natives of the State, there probably not being 100 tongmen in the whole State not born and raised there, and about one-fourth of them are colored. All are not entirely dependent on oystering for support, the greater number engaging also in agricultural pursuits, while many of the remaining find occasional employment in the various industries of the bay counties. Most of them own small homes and an acre or so of ground, which constitutes a garden.

There are few workmen in America more independent than these. At almost any time during the season a tongman can in a good working day catch from 4 to 12 bushels of oysters, for which there is always a demand almost at his door. Then having sufficient to supply his temporary needs he usually takes things easy. While some are indolent and work only when compelled by necessity, yet as a class they compare favorably in industry and morals with any other body of men similarly situated.

The annual incomes of the tongmen range from $100 to $800, averaging about

$225. They sell their catch to the neighboring market-houses or to the transportation vessels. Usually the men engaging in this fishery do not work therein more than about 125 or 140 days during the season, the rough weather interfering with their operations during the rest of the time. During September, October, and November, which are particularly pleasant months on the Chesapeake, they average about 20 days each month; but in January and February they work only about 5 to 15 days each, and occasionally during those two months they are compelled to remain ashore for weeks at a time.

DREDGING.

Historical notes.—The use of dredges in the oyster fishery of Maryland originated about the beginning of the present century. In the early history of the industry the small quantity of oysters required to supply local markets did not warrant the purchase of these implements, but as the demand increased the more efficient apparatus was brought into use, and dredges were soon employed in all the waters of the State in which oysters were obtained in large quantities for commercial purposes, this being confined mostly to the lower portions of the bay. But their use had long been regarded as destructive to the reefs, and the opposition to them dated from their introduction into these waters.

The first oyster law of Maryland (L. 1820–21, ch. 24), passed December 22, 1820, was enacted to prohibit their employment in any part of the State, this enactment being preceded by the preamble given on page 209, which sets forth the reasons for adopting this extreme protective measure. This regulation, however, on account of the extensive area of water to be protected, could not be fully enforced. In the attempt to enforce compliance with its provisions each tide-water county took the matter in hand, and the sheriffs with their deputies and the posse comitatus frequently sallied forth, impressing sail and steam vessels into their service to arrest the offenders, but without accomplishing the desired result. The law, however, was frequently reënacted or amended with increased or more easily applied penalties, and from 1820 to 1865 the use of any form of dredges in catching oysters in Maryland waters was unlawful, except as affected by a local regulation enacted in 1854 authorizing the use of scrapes in the waters of Somerset County by the citizens thereof.

The difficulty experienced in wholly preventing this mode of oystering and the doubt entertained by many persons as to the good policy and utility of such a procedure, together with the need of revenue in the State treasury, led to the compromise of 1865 and the adoption of the license system.

This system provided in reference to dredging as follows: The comptroller of the State treasury was required to issue a license to any applicant who had been for the twelve months immediately preceding a resident of the State, said license authorizing him to use a vessel owned by him in catching oysters by means of dredges from September 1 to June 1 following, in each year, "within the waters of the Chesapeake Bay, and not within any other bay, river, creek, strait, or sound, and not on any oyster bed or rock on or about Tally Point, Sandy Point, Hackett Point, Thomas Point, or Three Sisters, on the western side of the Chesapeake Bay, and not within the Chesapeake Bay where the water is less than 15 feet deep." The fee for the license was placed at $5 per ton, the license to be renewed annually. Steam was not permitted to be used in any manner in the catching of oysters, and all licensed vessels

were required to carry printed numbers on their sails in a particular manner so that they might thereby be easily identified.

The State records show that during the first season after the adoption of this regulation, the number of dredging licenses issued was 391, the amount of license money paid for these being $43,862.40. The first license to dredge oysters issued by the State was granted on August 1, 1865, to the Baltimore schooner *Alice*, 37.41 tons measurement. According to records furnished by the late Mr. C. S. Maltby, the quantity of oysters taken by the dredging vessels amounted during that season to 3,663,125 bushels, including the catch made by the scraping vessels of Somerset County, which during that season was very small.

As the scraping regulations of Somerset County, which had then been operative eleven years, had encouraged the building of a large number of vessels suitable for using dredges, a greater number of licenses were issued to residents of that county than any other. Almost an equal number of vessels owned at Baltimore, and which had been engaged in transporting oysters and farm produce, were also licensed. The vessels from Somerset County, having been built for use in Tangier Sound, were smaller than those from Baltimore, the average tonnage from the two places being 20.10 and 25.36, respectively, and the total number of vessels licensed in those two localities 189 and 154, respectively. The number of vessels licensed in that season from the other counties was only 48, with an average tonnage of 22.34 tons, making a total of 391 vessels and 8,772.48 tons.

At the next session of the general assembly (L. 1867, ch. 184) the dredging regulations were somewhat modified, the principal changes consisting in a reduction in the license fee from $5 to $2 per ton and the adoption of other methods of enforcing the penalties for violations. By this act, in addition to the reefs mentioned in the act of 1865, the dredgers were prohibited from working on or about Holland Point bar and Plum Point; but the restriction against dredging in the Chesapeake Bay (the "State waters") where the water is less than 15 feet deep was removed.

In 1868 the license rate was again changed (L. 1868, ch. 406), this time to $3 per ton, at which it has remained to the present time. By this act, in addition to the reefs heretofore mentioned, Swan Point reefs were reserved from the dredgers.

According to estimates furnished by Mr. Hunter Davidson, the commander of the fishery force from 1868 to 1872, the quantity of oysters taken by the dredgers and scrapemen combined in 1868–69 was 6,305,600 bushels; in 1869–70, 7,190,400 bushels; in 1870–71, 6,686,400 bushels, for which the fishermen received $2,216,960, $2,516,640, and $2,240,240, respectively.

In 1870 (ch. 364) the close season on dredging was increased thirty days, being changed from June 1–August 31 to May 15–September 15; and by the act of 1874 (ch. 181) this was again increased thirty days, being placed at May 1–September 30. By the latter act the dredgers were further prohibited from working within one-fourth mile west of Poplar Island or on the valuable reefs between that island and the mainland, but as a concession the lower portion of Eastern Bay was thrown open to their use.

By act of 1880 (ch. 198) the close time on dredging was increased forty-five days, being changed to April 1–October 14, this being the close season operative at present, except that the close time in the Potomac River is from April 1 to October 31.

In 1884 (ch. 518) it was required that the dredging license should expire at the end of the season instead of running for a year after date of issue, as was previously the case; and in 1886 vessels were permitted to obtain a license after the beginning of

the season at the rate of 50 cents per ton per month for the remainder of the season. The latter provision, however, was repealed in 1892.

The regulations now governing the licensing of dredging vessels are as follows:

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, issue a license to such resident, and to no other person, to employ such boat in taking or catching oysters with scoop, dredge, or similar instrument, within the waters of Chesapeake Bay, Potomac River, and in Eastern Bay, outside of a line drawn from the southwest corner of Kent Point to Wade Point; *Provided*, That nothing herein contained shall authorize the taking or catching of oysters with scoop, dredge, or similar instrument, on any oyster bar within one and a half miles of Talley Point, Sandy Point, Hackett Point, Thomas Point, Holland Island Bar, and Three Sisters, nor within one and one-half miles of Holland Point Bar; nor of Swan Point Bar; nor between Poplar Island and the mainland of Talbot County, south of a line drawn from the north point of Poplar Island to Louis Point, on the mainland; nor north of a line drawn from the end of the south bar of Poplar Island to Paw Paw Cave, on Tilghman Island; nor within one-fourth of a mile west of Poplar Island; nor within one-half of a mile of Plum Point; nor within the boundary lines of any county, unless herein otherwise specified; which licenses shall hold good for one season only, and shall only authorize the catching of oysters between the fifteenth day of October and the first day of April, on which day the dredging season shall end and the license expire.

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 may make oath before the clerk of the court of common pleas, or if a resident of a county, he may make oath before the clerk of the circuit court for 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 hereinbefore prescribed; that there is no lien on said boat held by a non-resident, directly or indirectly, and that the said boat is not held or shall not knowingly be used with an intention to violate or evade the provisions of this law; and such applicant shall produce before the comptroller at the time of making such application the certificate of the taking of such oath and the custom-house tonnage, which tonnage the owner shall swear to. The master of such boat shall also make oath before the comptroller, or his clerk, or, if a resident of Baltimore City, before the clerk of the court of common pleas, or before the clerk of the circuit court for the county wherein he may reside, that he has been a resident of this State for twelve months next preceding the time of taking such oath.

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 this State.

The comptroller shall have painted, in black figures on white canvas, two sets of numbers corresponding to the license to catch oysters with dredge or any other similar instrument; 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 securely 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 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 returned at the end of the season, and shall not be canceled or defaced; and no other number shall be exposed to view or used than that which is furnished by the comptroller.

The penalties, which are fully defined in the statutes, are ample for the satisfactory enforcement of the regulations, dredging without license or on forbidden areas being punished with imprisonment of the captain from three to twelve months and a fine of $100 to $500 on the vessel employed.

The use of steam vessels has never been permitted on the public reefs in Maryland, and while at present there is no interdiction against the use of vessels propelled by other artificial force, as electricity, etc., such a regulation would doubtless be adopted as soon as practicable were the use of such vessels attempted. At no time has there been in Maryland a restriction on the size of the vessels or the weight of the dredges used in the "State waters."

The close seasons operative in this branch of the fishery since 1865 are shown in the following condensed statement:

Years.	Close season.
1865–1869	June 1 to Aug. 31
1870–1873	May 15 to Sept. 15
1874–1879	May 1 to Sept. 30
1880	April 1 to Oct. 14

The following table exhibits, according to the State records, the number of dredging licenses issued in Maryland since the adoption of the license system:

Table showing number of dredging licenses issued in Maryland.

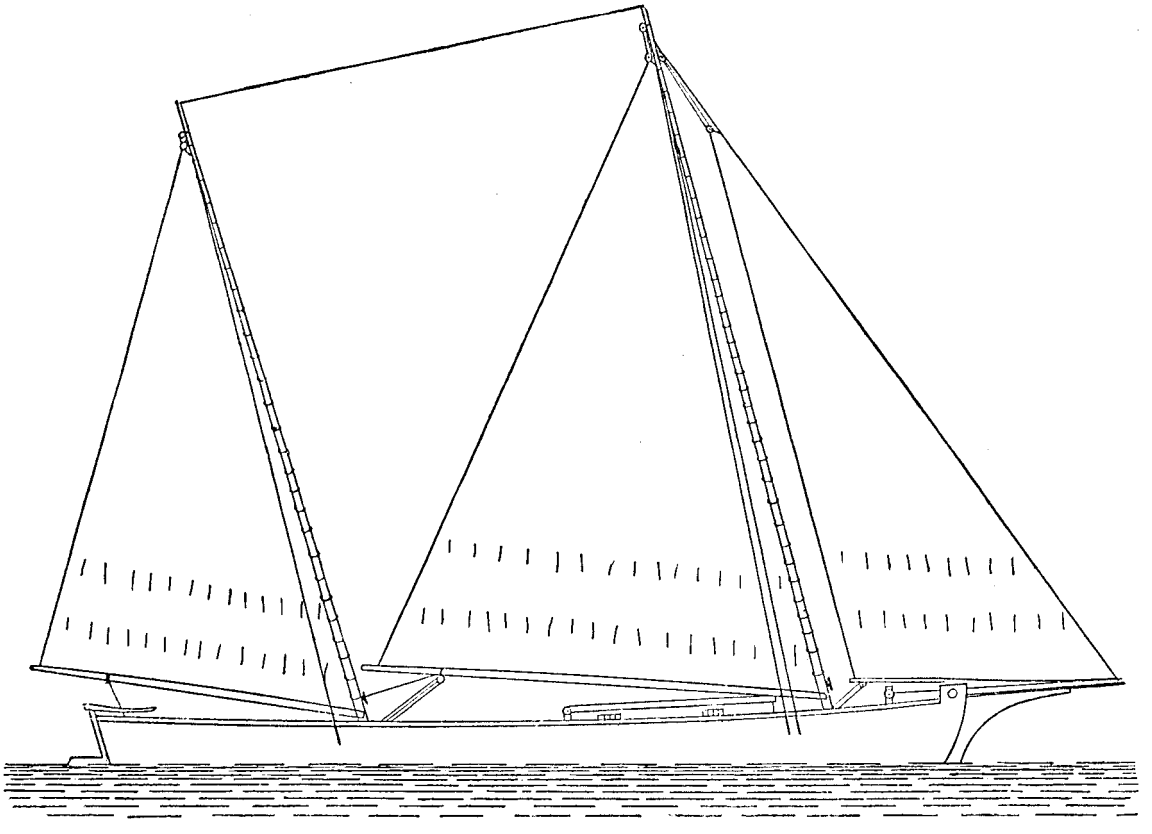
Season.	No. of licenses.	Season.	No. of licenses.	Season.	No. of licenses.	Season.	No. of licenses.
1865–66	391	1872–73	559	1879–80	327	1886–87	811
1866–67	401	1873–74	621	1880–81	531	1887–88	807
1867–68	438	1874–75	538	1881–82	728	1888–89	943
1868–69	563	1875–76	691	1882–83	674	1889–90	860
1869–70	642	1876–77	677	1883–84	501	1890–91	821
1870–71	637	1877–78	565	1884–85	955	1891–92	770
1871–72	597	1878–79	465	1885–86	879	1892–93	719

It will be observed that from 1878 to 1881 the number of licenses issued was much less than during the seasons immediately preceding and following. While it is true that a decrease did take place in the number of vessels dredging, yet it was scarcely so great as is indicated by the license list, and the decrease in the number of licenses issued was due to failure on the part of a number of the vessels to comply with the license regulations. This was largely due to the difficulty of convicting illegal dredgers. Under the law of 1878, the wet oysters and ropes lying on deck were not sufficient to convict offenders, but it was necessary therefor that sworn statements should be made that the dredges were hauled and that oysters, and not rocks or stones, were brought up thereby; but in 1880 this defect in the regulations was remedied.

The largest annual product from this branch of the oyster fishery was probably obtained in 1873–74 or 1875–76, with 1884–85 and 1888–89 following close behind.

The dredging-grounds.—The water area in Maryland on which this branch of the fishery is at present authorized approximates 1,300 square miles, of which about 121 square miles are covered more or less abundantly with natural oyster-reefs. The most valuable of these are located between Plum Point and Point Lookout on the Western Shore, on the Eastern Shore along Kent, Sharp, and Hooper islands, and on each side of the Potomac River. In the early part of the season the dredging vessels usually work off Kent and Sharp islands, and later, as the oysters on those reefs become less plentiful, the beds lower down the bay are resorted to.

The depth of water over the reefs varies from that scarcely sufficient to float the vessels down to 60 or more feet, but the average depth is from 15 to 30 feet. The mount of empty shells and débris on the beds amounts to something less than 1 bushel to every bushel of oysters. About 42 square miles of the natural reefs are located in the Potomac River, and are resorted to also by the oystermen of Virginia, who take therefrom about 500,000 bushels annually. The annual product obtained by Maryland oystermen from all the dredge reefs situated in "State waters"



Scale
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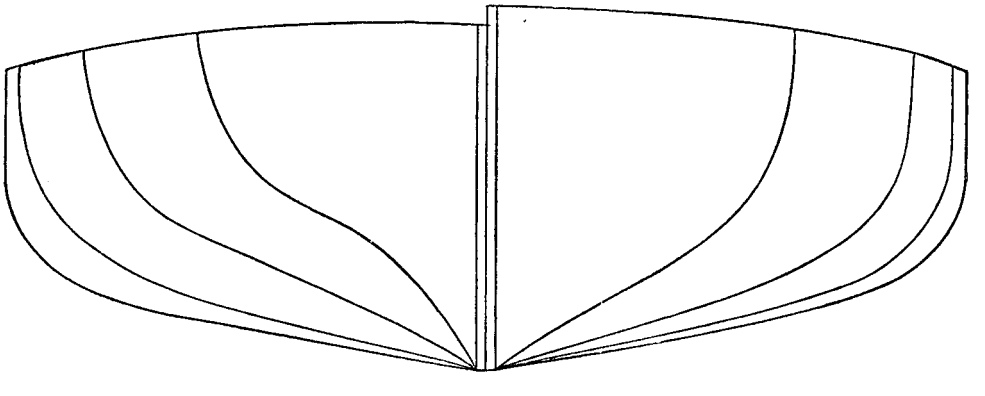

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CHESAPEAKE BAY BUG-EYE.

during the last five seasons has averaged 2,950,000 bushels, valued at $1,450,000, an average of 24,386 bushels and $11,990 to the square mile. About 200 of the dredging vessels work also under the scraping law in the "county waters" of Somerset, Dorchester, and Talbot counties, and catch therein annually about 500,000 bushels in addition to the foregoing.

The oysters obtained by the dredging vessels are generally larger and command better prices than those obtained from the tonging or scraping areas. But the condition of the dredging-ground during the last four years has not been as satisfactory as that of the tonging and scraping grounds. The implements and vessels are more effective, and the quantity of oysters left on the reefs has been growing smaller each year. On a number of the once prominent reefs profitable oystering has not been found for several years. This is true of the Western Shore from the "Steps" down to Cove Point, and to some extent of the "Lumps" and the Kent shore.

The boundaries of the dredging areas as defined by law must necessarily consist of imaginary lines, for the great extent of the water area of Maryland has up to the present time rendered a resort to buoying or similar indications too expensive for adoption. This fact, together with the frequent necessity for the dredging vessels to enter the small tributaries for harbor protection and other purposes, makes it practicable for the vessels, particularly upon dark nights or foggy days, to take oysters from areas outside of their authorized limits. It is quite difficult to convict offenders and even then suitable punishment is not always certain. The number of the dredging captains, however, who make a practice of oystering outside of their prescribed limits is small; but as long as the inducements to dredge on forbidden grounds is greater than the punishment therefor, some of the dredgers can not be prohibited from catching oysters from such reefs as yield them the greatest returns.

Dredging vessels and boats.—Distinct and peculiar classes of vessels and boats, long celebrated for their speed and beauty, have been evolved in the Chesapeake Bay for use in dredging. These range in size from the smallest craft barely able to carry two men with the small quantity of oysters they may catch in one day to large schooners 75 feet in length and measuring 70 tons, with a carrying capacity of 3,000 bushels. The value ranges from $80 to $7,000 each, and averages about $900, the tonnage averaging 20.76 in 1892–93. The largest vessel that has engaged in dredging during the last two or three seasons is the *A. H. Shultz*, of Baltimore, the length of which is 74.4 feet, breadth 23.5 feet, depth 7.4 feet, and tonnage 71.20, with a crew of 12 men.

The types of vessels employed in this branch of the oyster industry consist of bug-eyes, schooners, pungies, and large canoes and sloops. The bug-eye, which is peculiar to the Chesapeake, is a development of the canoe, from which it differs chiefly in having a sharp prow, from a peculiar feature of which it derives its name, and in being decked over from end to end with suitable hatchways and without bulwarks. The large bug-eyes can not be made of logs, but must be framed and planked. They range in length from 25 to 75 feet and in cost from $300 to $2,500, and carry from 50 to 1,800 bushels of oysters.

The schooners and large sloops do not differ materially from those employed along other portions of the Atlantic coast. Pungies are similar to the schooners, the chief difference being in the former having a fuller bow and sharper stern than the latter, facilitating the rapid tackings desirable in dredging across the oyster reefs.

During the summer many of these vessels find employment in transporting farm produce and other commodities obtained or utilized along the shores of the bay.

The following exhibit shows the number of the various types of vessels and boats employed in dredging during the season 1892–93:

Types.	No.
Sloops	32
Canoes, etc	91
Bug-eyes, schooners, and pungies	596
Total	719

The vessels and boats hailing from the Eastern Shore are generally in part or entirely owned by their respective captains, but the greater number of the Baltimore vessels are owned by merchants, commission sellers, etc. Of the 719 vessels and boats engaged in dredging during the last season, 1892–93, 324 were owned in whole or in large part by the captains in command of them.

The following tabular statement exhibits the number of owners of the vessels licensed to dredge in 1892–93, with their respective holdings:

Classification of owners.	No. of owners.	No. of vessels.
Men owning 1 vessel	296	296
2 vessels	76	152
3 vessels	34	102
4 vessels	18	72
5 vessels	7	35
6 vessels	3	18
9 vessels	1	9
10 vessels	1	10
12 vessels	1	12
13 vessels	1	13
Totals	438	719

This statement shows that 4 men own 44 vessels, or one-sixteenth of the total number; 66 men own 271, or three-eighths of the total; and 142 men own 423, or three-fifths of the total dredging vessels and boats employed.

The following table, exhibiting for each county the number of dredging vessels and boats in each tonnage grade, is of interest, especially to persons desirous of effecting a tonnage limit on the vessels operating in the "State waters."

Table exhibiting by counties the tonnage grade of vessels engaged in dredging in 1891–92.

Counties.	Tonnage.													
	Under 5	5–10	10–15	15–20	20–25	25–30	30–35	35–40	40–45	45–50	50–55	55–60	70–75	Total.
Somerset	11	72	82	63	43	33	22	12	15	5	.....	3	1	362
Wicomico	.....	1	1	2	1	.....	.....	.....	.....	.....	.....	.....	.....	5
Dorchester	.....	25	1	2	2	3	1	3	3	.....	1	1	.....	42
Talbot	.....	10	.....	1	.....	1	.....	.....	.....	.....	.....	.....	.....	12
Kent	.....	.....	.....	1	.....	.....	.....	1	.....	.....	.....	.....	.....	2
Baltimore	.....	2	6	24	34	36	45	27	32	10	3	2	.....	221
Anne Arundel	1	15	4	2	2	.....	1	1	.....	.....	.....	.....	.....	26
Calvert	20	15	2	.....	2	.....	1	.....	.....	.....	.....	.....	.....	40
St. Mary	39	12	1	1	2	3	.....	.....	.....	.....	.....	.....	.....	58
Charles	.....	1	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	2
Total	71	153	97	96	86	76	71	44	50	15	4	6	1	770

The average "length of life" of a dredging vessel is about thirty-five years. As this branch of the oyster fishery has been prosecuted less than that time, and as the number of vessels built each year indicates in a general way the prosperity of the fishery, the following table is presented, showing the years in which were built the vessels and boats employed in 1891–92:

Table showing the years in which were built the vessels dredging in 1891–92.

Counties.	1827.	1835.	1840 to 1844.	1845 to 1849.	1850 to 1854.	1855 to 1859.	1860 to 1864.	1865 to 1869.	1870 to 1874.	1875 to 1879.	1880 to 884.	1885 to 1889.	1890 to 1892.	Unknown	Total.
Somerset	.....	.....	.....	5	11	12	14	32	61	42	88	61	24	12	362
Wicomico	.....	.....	.....	.....	1	.....	.....	1	1	.....	1	.....	.....	1	5
Dorchester	.....	.....	.....	.....	.....	.....	1	4	5	6	18	4	2	2	42
Talbot	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	2	5	4	.....	12
Kent	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1	2
Baltimore	1	1	3	18	17	26	27	34	38	8	34	5	3	6	221
Anne Arundel	.....	.....	.....	.....	.....	.....	.....	1	4	3	8	9	1	.....	26
Calvert	.....	.....	.....	.....	.....	.....	.....	1	3	6	11	9	4	6	40
St. Mary	.....	.....	.....	.....	.....	.....	1	3	7	8	12	9	4	14	58
Charles	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	2
Total	1	1	3	23	29	38	43	78	119	73	174	102	42	44	770

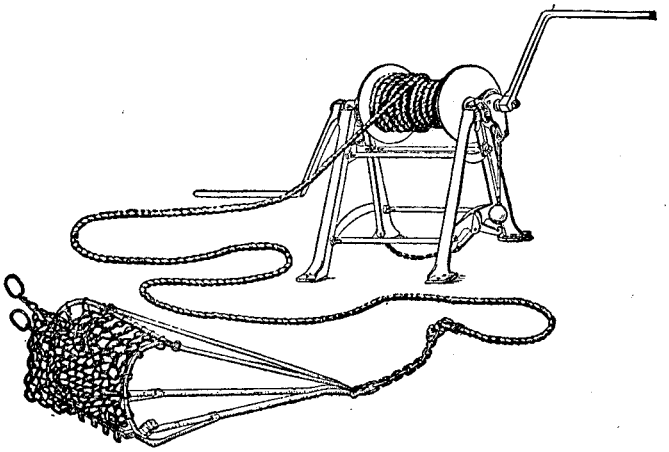
This table shows that from 1875 to 1879 and from 1885 to 1892 the inducements to build dredging vessels and boats were much less than during the periods immediately preceding, the number built during these thirteen years being an average of 16 per year, while from 1870 to 1874 and from 1880 to 1884 the average number each year was 29. In 1890–91 the oldest vessel engaged in dredging was the *Intrepid*, 32.16 tons, which was built in 1810 and is doubtless the oldest vessel in America. The *Juvenile*, 32.39 tons, the *Halcyon*, 17.02 tons, and the *William Washington*, 18.98, built, respectively, in 1827, 1835, and 1836, ranked next in the order of age. During the next season the *Intrepid* left the business to younger and more speedy boats, but the *Juvenile* and *Halcyon* remained in the fishery during that season and also in 1892–93.

For the purpose of exhibiting the distribution of the dredging vessels and boats the following table is presented, showing the number hailing from each county during the seasons noted:

Table showing by counties the number of vessels licensed during certain seasons.

Localities.	1868–69.	1886–87.	1888–89.	1891–92.
Somerset	238	355	444	362
Wicomico	12	15	16	5
Dorchester	46	33	38	42
Talbot	.....	16	9	12
Queen Anne	1	1	1	.....
Kent	1	8	11	2
Baltimore	240	290	298	221
Anne Arundel	20	26	25	26
Calvert	1	45	41	40
St. Mary	2	21	60	58
Charles	2	1	.....	2
Total	563	811	943	770

Apparatus and methods.—Each vessel engaged in dredging oysters in Maryland is provided with two dredges and two "winders" or windlasses for hauling the same, excepting that the very small boats employed have only one dredge and one windlass. The average weight of the dredge is about 100 pounds, no restriction on the size having ever been made in this State. They range in width from 2 to 4 feet, with from 8 to 18 teeth, the greater number of them being 3 feet wide, with 12 to 14 teeth. The "winders" are securely fastened to the deck of the vessel about midship, one being located on each side. Opposite these and on the gunwales are placed rollers 3 or 4 feet in length to facilitate the lifting of the dredges. The average value of the dredges, winders, rollers, chains, and lines on each vessel is about $100. The winders employed on the better class of the vessels in the Chesapeake are so constructed that if the dredge should catch on some obstruction on the bottom the drum is automatically thrown out of gearing and the dredge rope allowed to run out.



CHESAPEAKE OYSTER DREDGE AND WINDER.

The vessel is controlled by the captain, who remains aft in order to attend to the steering and manage the sails; the mate, when one is carried, stands midship directing the manipulations of the dredges, which are lifted by the winders, operated by the common hands. The vessel is usually worked with the wind, and may dredge lengthwise or across the reefs. It requires from one to four weeks to obtain a load of oysters, the catch averaging from 20 to 80 bushels per day. Most of the vessels transport their catch to market, but some remain down the bay for months and sell their catch to the "buy" or transportation vessels. As they move from reef to reef, according to the condition and abundance of the oysters, frequently from 50 to 200 vessels may be sighted at work in a single locality. It is reported that the provisions used on the vessels are much better now than formerly, both in quantity and quality. The cost for an average-size vessel is now about $40 for a trip lasting three weeks.

Probably no question of economic importance connected with the fisheries has led to more dispute or to a wider difference of opinion among rival theorists and practical fishermen both of America and Europe than that relative to the effects of dredging upon oyster beds. The use of these implements beyond the productive powers of the reefs, when no provision is made for replacing breeding oysters thereon, is injurious; but the same is true of any other form of apparatus. Dredges may also injure some of the oys-

ters by tearing them open or crushing them, but the number thus destroyed is probably not large on those beds operated on year after year. The oyster-culturists of New York and Connecticut find it to their advantage to use dredges many times the weight of those employed in Maryland. The use of these implements merely to stir up the oyster beds just prior to the spawning season, and thus to some extent clean the shells on the bed for the attachment of spat, is of much value. But after the spawning season the use of heavy implements is certainly injurious until the shells of the young oysters have acquired sufficient strength to resist being crushed by their action.

Men on dredging vessels.—The crew of a dredging vessel usually consists of the captain, mate, cook, and from two to nine common hands, according to the size of the craft. The captains are all citizens of the State, and the greater number of them are married and have homes in Baltimore or "down the bay." They are usually possessed of a little means and have a social standing in their local communities. Many of those residing in the counties have farms, to which their attention is devoted when not afloat. Others during the close season engage in the transportation of wood, farm produce, etc. Away from the Chesapeake the Maryland dredging captains are regarded as a reckless and lawless class of men. This does these men a great injustice; they are as peacefully disposed as the generality of mankind, engaged in a lawful and useful occupation, and obey the statutes as fully as the oystermen of any other State. But it is not surprising that out of 800 dredging captains there should be a few reckless and unprincipled persons, for this is generally the case in every other vocation. The mate or chief assistant is generally a man younger than the captain, from the same locality, and usually expects within a few years to be in full command of an oyster vessel.

As to the remaining members of the crew, some small vessels from the counties obtain men from the localities in which the vessels are owned or in which the captains live; but the great majority of vessels employ an entirely different class of men, who are in no sense baymen and to whom the dredging of oysters is frequently an episode rather than a pursuit. They have no peculiar knowledge of the business, being required merely to turn the winders that lift the dredges and to cull the oysters after they are brought on deck. So great discredit has been brought upon this branch of labor that none but the most destitute persons can be induced to do the work, and in order to man some of the vessels at times it is necessary to resort to means that strongly resemble impressment and violence. Very few of these men have homes; they come to Maryland at the opening of the dredging season from all parts of the country, without money and almost without clothes, being driven to the city to seek work by reason of the stress of weather. They usually hire out by the trip, which may last from ten to forty days, at a rate varying from $8 to $18 and provisions.

The captain of the vessel does not bargain with the men and frequently does not know of whom his crew consists until he is ready to proceed on the trip. There are persons in Baltimore who make a business of furnishing men for the vessels. They have small rooms in which are quartered the men seeking the work or whom they may have induced to accept of it. When these labor brokers receive an order to furnish a vessel with a certain number of men, they see that the men are properly on board, and for this service collect $2 for each man obtained, this fee being paid by the captain and afterwards deducted from the compensation of the laborer. The laborers are advanced a small sum of money, usually about one-fourth of the total wages, for

the purchase of clothing, especially oilskins, and such other things as they may desire.

Less than 12 per cent of these common hands are natives of Maryland, and many are unable to speak the English language. From the statements given by each man at the offices of the shipping commissioners in Baltimore, in 1892, I have learned the nativity of 2.438 of them, this being exhibited in the following tabular statement:

Nativity of common hands on Maryland dredging vessels in 1892.

United States.	No. of men.	Foreign countries.	No. of men.
Maryland	292	Germany	461
Pennsylvania	257	Ireland	427
New York	226	England	112
Virginia	89	Poland	62
Massachusetts	86	Russia	46
New Jersey	42	Scotland	45
Connecticut	34	Austria	36
Illinois	23	British Provinces	18
District of Columbia	14	Sweden	17
Ohio	13	France	15
Georgia	10	Switzerland	14
Delaware	8	Denmark	11
Michigan	7	Spain	8
Rhode Island	6	Norway	8
California	5	Africa	5
Wisconsin	5	Italy	3
Alabama	5	Portugal	2
Maine	4	Holland	2
Kentucky	4	Wales	2
North Carolina	3	"At sea"	1
New Hampshire	3		
Texas	2		
Vermont	1		
South Carolina	1		
Tennessee	1		
Colorado	1		
West Virginia	1		
Total, United States	1,143	Total, foreign countries	1,295

While this does not exhibit the total number of men shipped during that season, yet the total proportionate representation from the various States and countries does not materially differ from that here presented. The fact is here disclosed that less than one-half of these men are natives of the United States and less than 12 per cent are natives of Maryland, each of two foreign countries supplying many more men than that State.

It should be observed that while it required only 1,964 persons to man the 221 vessels hailing from Baltimore city in 1891–92, yet the number of men shipped on those vessels during that season was much greater. This is due to the fact that many men made only one trip and others but two or three.

Prior to going on a trip these men are required to sign articles of agreement before certain officers, and from these papers it has been learned that out of a total of 992 men shipped during one month in 1892 only 413, or 43 per cent, were able to write their names. Of those born in America only 25 per cent were able to write, and of the foreign-born 55 per cent were similarly situated. The reason for the proportion of illiterate men being so much greater among Americans than among those of foreign birth is that many immigrants of fair education readily accept of this labor, while as a rule only the most destitute Americans resort to it. During the same season one vessel was manned by a crew of 9 men, representing 6 nationalities, and not one of the persons on board, including the captain, was born in America, only 3 were able to converse in English, and not one was able to read or write in any language. This, however, was very exceptional.

The following data, furnished by Surgeon-General Wyman of the U. S. Marine Hospital Service, showing the nature and extent of the accidents to which these men are subjected, are here presented. In estimating the value of these figures it should be remembered that Baltimore is but one of many ports of relief for Chesapeake Bay, and that if records were obtained from Crisfield, Cambridge, Oxford, Annapolis, Washington, and other points, the figures would be much larger. Only surgical cases are included in the list, no computation having been made of the number of cases of pneumonia, pleurisy, and rheumatism brought into hospital from the oyster vessels.

Summary of surgical cases from oyster vessels treated in hospital by the U. S. Marine Hospital Service at Baltimore, Md., in winters of 1882–83 and of 1883–84.

Character of injuries.	No. of cases.
Fractures caused by crank handles of winders	20
foreign bodies	7
falls on slippery decks, etc	14
Dislocation caused by crank handle	1
Frozen extremities	50
"Oyster-shell hands"	30
Wounds contused and lacerated caused by falls	16
foreign bodies	19
crank handles	15

Total fractures, 41 cases with 72 broken bones. Total surgical cases treated in hospital, 193. In addition to the foregoing a large number of cases were treated at the dispensary without being sent to hospital.

The "oyster-shell hand" is a severe inflammation caused by wound and poisoning from the oyster shells. The hand appears as if affected by a huge felon, and deep and free lancing is necessary in its treatment. The tendons and bones are often exposed and loss of one or more fingers sometimes results.

Much has been said about the brutality of the dredging captains and the severe treatment to which they subject their crews. But the captains are not wholly responsible for the sufferings of these men; as a rule they, as most other employers of labor, are humane and considerate of those in their service. Proof of this is found in the fact that when the men get in trouble on shore they frequently send to the captain of a vessel for relief, and some men return year after year to seek employment on the vessels. While in the aggregate the number of cases of harsh treatment may seem large, yet such is not the case when consideration is taken of the number of men employed and their entire unsuitability for the work. They are so unaccustomed to discipline that the exercise of that authority necessary on board of a vessel unavoidably produces some unpleasantness between the captain and the men. The very nature of the occupation, working upon slippery decks in freezing weather, together with the unskilled ability of these men, results in much suffering, for which the captain is in no sense blamable and for which, because of the financial interests involved if nothing else, his regret is second only to that of the unfortunate member of his crew. And when one investigates the life of these men when on shore and compares it with that led while on a dredging trip the natural inference is that in many instances the latter is the more comfortable, and that not infrequently the men are better off when on the bay than they are in the city.

The vessel-owners recognize the injury that the employment of this class of labor is doing to the reputation of their business and they would gladly welcome a change in the grade of men they employ. The payment of higher wages would of course secure better men, but the present profits of the fishery and the active competition with one another, which have produced this condition, will not admit of a few paying higher wages without concerted action, and that seems impracticable. Many methods

of State regulations for effecting the desired result have been suggested, few of which have been considered of sufficient practical value for adoption.

The most noticeable effort to improve the condition of these men was made by act of 1888 (ch. 513), which provides for the appointment by the governor of a number of "shipping commissioners" in Baltimore and the large ports down the bay, whose duty it is to supervise the engaging of employés on vessels measuring over 10 tons, except such men as work on shares and residents of the county where the crew is shipped, the word "county" not applying to Baltimore City. These men are required to superintend both the engagement and discharge of the laborers, drawing up the contracts and seeing that they are fully complied with, receiving therefor a fee of 50 cents for each man shipped and 25 cents for each man discharged, one-half of these fees being deducted from the wages of the laborer and the remaining half being paid by the captain.

Financial results.—The profitableness of the dredging industry varies much from year to year, according to the prices of oysters and their abundance on the beds to which this branch of the fishery is confined. In general it is not so profitable now as it was twenty years ago. On account of the large number of vessels engaged the marketable oysters are mostly secured during the first few months of the season, and the vessels do not find it profitable to work as late in the year as they formerly did, a large number of them during the last few seasons leaving this branch of the business about Christmas.

The length of time now required to obtain a cargo is also greater than formerly, this now being fifteen to twenty-five days, whereas eighteen and twenty years ago a cargo could usually be secured in a week or ten days. This, of course, reduces the profits very materially, and the books of the vessel-owners indicate that after paying all expenses, including wear and tear on the vessels, the profits are not very great, and vessel property of this class is now comparatively cheap in the Chesapeake.

If the vessel be not owned by the captain, the latter, with very few exceptions, runs it on shares, the arrangement being sometimes as follows: Out of the bill of sale are paid the wages, food bill, expenses of sale of oysters, etc., and from what is left the captain receives 40 per cent and the vessel-owner 60 per cent. A more frequent method is for the owner of the vessel to receive one-third of the value of the catch and the captain to take the balance and pay all expenses. Many other forms of agreement exist. These ordinarily net the captain from $35 to $85 per month, according to the abundance and prices of oysters.

The mate and the cook ship on wages, varying from $15 to $25 per month, with board. The common hands are usually paid by the trip at rates varying from $8 to $18, according to the abundance of employés and the ability of the men secured. The number of men available for this work appears to be smaller each year, and as a consequence the wages are increasing somewhat. In 1890–91 the average per trip was $13.69, and in 1891–92 it was $14.43, these figures representing the condition for the fleet. The better class of common hands ship by the month, at rates varying from $12 to $25, but the number of such men is small. On a few vessels from the counties the laborers work on shares, the agreements usually being as follows: The provision bill, commission sellers' charges, and similar expenses are first paid, then the owner of the vessel receives one-third of the balance and the captain receives a bonus of $15 to $25, after which the captain and members of the crew share alike.

SCRAPING.

Historical notes.—The expression "scraping" is here applied to the taking or catching of oysters by means of a scrape or dredge within the waters of a county, "dredging" being applied to the same form of fishery when prosecuted in the "State waters." It is termed scraping from the fact that the vessels used are generally much smaller than those employed in the "State waters," and consequently must employ lighter dredges, which are known as scrapes. This branch of the oyster industry is prosecuted only in certain portions of three counties of the State, viz, Somerset, Dorchester, and Talbot. It originated in Somerset in 1854, eleven years before dredging was authorized in "State waters." Sixteen years later the use of scrapes was authorized on the southern shore of Dorchester County, and in 1874 on the northern shore of that county and in portions of Talbot.

The regulations permitting the use of scrapes in Somerset (L. 1854, ch. 4) authorized any citizen of that county, after obtaining a license therefor, to use a vessel owned in the county to "catch oysters with a scrape or drag in any of the waters of said county, not parcel of any creek or river, not within 200 yards distance from the shore, and in waters not less than 21 feet deep." The license, which was issued by the clerk of the circuit court, was operative for one year without close season, and cost $15 for each vessel, all moneys arising therefrom being paid into the school fund of the county, excepting 50 cents for each license, which went to the issuing clerk as his fee. As a large portion of Tangier Sound is situated within the limits of Somerset, this act opened to the use of the scrapemen a large area of very valuable oyster-ground.

By the act of 1867 (ch. 129) the restriction against scraping in Somerset within less than 200 yards of the shore and in waters less than 21 feet deep was removed, and the license fee was reduced from $15 to $10. But this act also required that before receiving a license to scrape oysters the applicant should obtain from the comptroller of the State treasury a dredging license, in accordance with the general license law of the State, which had then been in force for two years, and it was made unlawful for anyone to scrape for oysters in any creek, cove, or inlet, or during the period in which dredging was interdicted in the bay, viz, June 1–September 1.

Prior to 1877 the oystermen of Somerset enjoyed the privilege of scraping in a large portion of Pocomoke Sound, but after the award of the boundary commission of that year their operations were confined to the Maryland side of the new line, giving them only 23 square miles of area on the Pocomoke side of the county. In 1880 (ch. 445) the use of scrapes in this portion of the Pocomoke Sound was prohibited.

In 1884 the annual rate required to be paid for scraping licenses in this county was changed from $10 each vessel to $2 per ton of measurement, and it was further required that only such vessels as measured over 10 tons should obtain a State license before being licensed to use scrapes. In 1886 (ch. 489) the scraping license fee was reduced to $1 per ton and in the same year the close time was changed to April 1–September 30.

By act of 1890 (ch. 629) the general assembly authorized an election to be held on May 13 of that year, in certain districts of Somerset, to decide whether to prohibit scraping in the waters of that county. The vote was favorable to the interdiction, but the courts decided that the procedure was irregular.

The scraping law operative on the southern shore of Dorchester County originated in 1870 (ch. 129), sixteen years after the privilege was first enjoyed in Somerset County.

This law required the clerk of the circuit court of Dorchester to issue licenses to boats and vessels owned by citizens of that county, authorizing them to use scrapes in certain waters on the southern shore thereof between October 1 and April 30 in each year. It was required that the licensed boat should not exceed 5 tons measurement, and the license fees were established as follows: For every boat measuring less than 20 feet in length the sum of $5; from 20 to 25 feet, the sum of $8; from 25 to 30 feet, $10, and all over 30 feet in length the sum of $20, the revenue derived therefrom being paid into the State treasury. In 1872 (ch. 181) it was required that the license fees thereafter should be paid into the treasury of the county school fund.

In 1874 (ch. 214) the scraping law for southern Dorchester was modified, the principal changes being in raising the limit of measurement of the craft employed from 5 to 10 tons, changing the license fee to $3 per ton, and in not permitting scraping within 200 yards of the shore, nor from May 1 to September 14. But in 1878 the license fee was reduced to $2 per ton, and soon thereafter all boats measuring under 5 tons were required to pay a fee of $8 each, without regard to their actual measurement. In 1882 (ch. 327) the close time for scraping in these waters was changed from May 1–September 14 to April 1–September 30, and in 1892 (ch. 278) it was again changed to March 1–September 30.

The law authorizing scraping within certain limits of Talbot County, and which is common to that county and the northern shore of Dorchester County, originated in an act of 1874 (ch. 437) authorizing any twelve-month resident of either county to obtain a license permitting him to catch oysters from September 15 to April 30, by means of scrapes, in certain waters of those two counties. The license was obtainable from the clerk of the circuit court for the county of which the applicant was a resident, and no provision was made for licensing vessels measuring over 10 tons. The fee was placed at $3 per ton, the revenue derived therefrom being devoted to the school fund of the county in which the license was issued. In 1876 (ch. 405) the scraping season was changed to September 15–May 31, and in 1878 (ch. 359) the license fee was reduced to $2 per ton. By act of 1884 (ch. 468) all boats measuring less than 5 tons were required to pay $8 license fee, without reference to their actual measurement, and the scraping season in the waters referred to was changed to October 1–March 31, it being again changed in 1892 (ch. 278) to October 1–March 1.

The following statement exhibits in a condensed form the close seasons that have been operative in scraping in each of the three counties in which this form of fishery is authorized:

Somerset.		Dorchester, southern shore.		Dorchester, northern shore, and Talbot.	
Years.	Close seasons.	Years.	Close seasons.	Years.	Close seasons.
1854-66.....	.....	1870-73.....	May 1-Sept. 30	1874-75.....	May 1-Sept. 14
1867-85.....	June 1-Sept. 1	1874-81.....	May 1-Sept. 15	1876-83.....	June 1-Sept. 14
1886-93.....	Apr. 1-Sept. 30	1882-91.....	Apr. 1-Sept. 30	1884-91.....	Apr. 1-Sept. 30
		1892-93.....	Mar. 1-Oct. 30	1892-93.....	Mar. 1-Sept. 30

The following table shows, so far as practicable, the number of scraping licenses issued in each county since the origin of this branch of the fishery. Much search

has been made to find the record for Somerset from 1854 to 1869, but without success. With this exception, the list is complete:

Table showing number of scraping licenses issued in Maryland.

Season.	Somerset.	Dorchester.	Talbot.	Total.	Season.	Somerset.	Dorchester.	Talbot.	Total.
1869–70	283	.....	.....	283	1881–82	173	153	83	409
1870–71	359	125	.....	484	1882–83	278	177	64	519
1871–72	453	130	.....	583	1883–84	262	218	64	544
1872–73	276	132	.....	408	1884–85	469	310	100	879
1873–74	224	106	.....	330	1885–86	370	402	125	897
1874–75	322	149	59	530	1886–87	428	334	93	855
1875–76	209	180	40	429	1887–88	337	373	85	795
1876–77	165	142	47	354	1888–89	262	433	85	780
1877–78	59	142	27	228	1889–90	356	502	105	963
1878–79	151	157	34	342	1890–91	632	550	116	1,298
1879–80	57	134	29	220	1891–92	640	582	78	1,300
1880–81	292	148	30	470	1892–93	647	483	102	1,232

Owing to a defect in the law operative at that time, a number of Somerset scrapemen from 1877 to 1880 engaged in this fishery without a license, and while the foregoing figures embrace all the licensed boats and vessels, it does not for those years include all that engaged in scraping. The defect was remedied in 1880, and since then there has been little, if any, difference between the number of boats licensed and the number actually at work.

The following table exhibits, by counties, the amount of fees paid for scraping licenses during each of the last five seasons:

License fees paid for scraping from 1889 to 1893.

Seasons.	Somerset.	Dorchester.	Talbot.	Total.
1888–89	$1,807.31	$5,222.52	$1,344.46	$8,374.29
1889–90	2,540.83	6,211.26	1,688.34	10,440.43
1890–91	6,786.20	6,584.75	1,806.00	15,176.95
1891–92	4,463.01	7,937.00	1,267.92	13,667.93
1892–93	5,205.22	6,468.30	1,660.22	13,333.74
Total	20,802.57	32,423.83	7,766.94	60,993.34
Annual average	4,160.51	6,484.76	1,553.39	12,198.67

Grounds, area, etc.—The total water area of the counties in which scraping is authorized is 510 square miles, and the area used by the scrapemen 277, of which the area more or less covered with natural oyster-ground approximates 80 square miles. The following tabular statement exhibits these data for each of the three counties:

Counties.	Water area.	Scraping area.	Reefs in scraping area.
	Sq. miles.	*Sq. miles.*	*Sq. miles.*
Somerset	183	112	39
Dorchester	207	118	26
Talbot	120	47	15
Total	510	277	80

The depth of water over these reefs averages about 32 feet, although in isolated places it may attain 100 feet. The general condition of the reefs in the three estuaries in which this fishery is prosecuted, viz, Tangier Sound, Choptank River, and Eastern Bay, has already been noted (see pp. 220–226). During the last five seasons the scraping

areas have been in much better condition than the dredging-grounds, this being particularly true of the Choptank River, and they are naturally more productive than the tonging areas. During the last eight years no branch of the oyster fishery has been more prosperous than this, and its extent during the last four seasons has been far greater than ever before. The average annual product of all the scraping-grounds of the State during the last five seasons has been about 3,250,000 bushels, an average of 40,625 bushels to the square mile. Of this amount about 500,000 or more bushels annually have been obtained by dredging vessels working at the time under scraping licenses.

Boats and vessels.—The boats and vessels employed in scraping number about 1,250, all of which are propelled by means of sail. They comprise the various types utilized in the tonging and dredging branches of the oyster fishery. As a general thing they are larger than those used in tonging and smaller than those engaged in dredging. The total value of those in use in 1892–93 approximated $650,000.

In Talbot and Dorchester counties no vessels measuring over 10 tons are permitted to engage in this branch of the oyster industry, while in Somerset no restrictions are placed upon the size of the vessels employed, and nearly one-fifth are over 10 tons measurement. The average size of the craft in the two former counties is about 7 tons, and in Somerset it is 8.07 tons. The number of vessels engaged in scraping in this county in 1892–93 and measuring over 10 tons was 119, the tonnage of which was 2,087.23, an average of 17.53 to the vessel; and the number under 10 tons was 528, the tonnage of which was 3,117.99, an average of 5.91. Each one of the vessels measuring over 10 tons was required to obtain license to dredge in "State waters," in addition to their county scraping license, before being authorized to scrape in the waters of Somerset. The largest vessel engaged in this branch of the fishery in that county in 1892–93 was the *Edna Earl*, which measured 40.76 tons.

The limit on the size of the vessels permitted to scrape in Dorchester and Talbot counties has had a peculiar effect on the size and model of those employed, the dimensions, which largely increase the tonnage of the vessel under the present form of measurement, as depth and breadth, being reduced as much as practicable. And it is stated that resort is also had to "dunnage" and other methods for reducing the measurement within the legal limit, and that vessels are employed in those counties which if built upon ordinary lines and models would measure 12 or even 15 tons.

The same complaint with respect to "dunnage," etc., prevails to a certain extent in Somerset, for while no limit is placed upon the size of the vessels permitted to be used in that county, yet if the vessel measures over 10 tons it is required to obtain, in addition to the scraping license, a State dredging license at the rate of $3 per ton. This, however, gives them also the privilege of dredging in the "State waters," which is of value when the reefs therein are producing more abundantly than the county reefs. In order to dredge in the "State waters" a number of the scraping vessels under 10 tons also during certain seasons obtain a dredging license. In 1891–92 the number of vessels doing this from Somerset was 80, from Dorchester 22, and from Talbot 9. These, together with the Somerset vessels measuring over 10 tons, make a total of about 220 of the 1,250 scraping boats and vessels employed also in dredging.

The scrapemen.—Except on the large vessels owned in Somerset County, the men employed on the boats and vessels engaged in the scraping branch of the oyster fishery are quite similar in characteristics and social standing to the tongmen. They mostly reside in houses along the shores of the waters where they operate. Some

of them during the close seasons engage also in farming or in other industries prosecuted in their native counties, which give opportunity for a few days' employment at odd times. They usually return to their homes every night and their boats do not frequently leave the waters in which they work, the catch being either delivered at the adjacent marketing houses or sold to the transporting vessels.

The men employed on the large vessels from Somerset County differ in little respect from those engaged in dredging, and are subject to the same regulations with reference to employment as provided by act of 1888, ch. 513.

OYSTER-CULTURE IN MARYLAND.

Historical notes.—The various modes by which the natural oyster-reefs in Maryland are being utilized have been discussed, and the attempts that have been made to utilize the barren areas now remain to be described. Little in this line has been done in Maryland, and that little has been almost entirely confined to the bedding or planting of small oysters on a few restricted areas and with much uncertainty of harvesting a crop. Innumerable efforts have been made to enact a system of regulations properly authorizing and encouraging ostreiculture, but these efforts have fallen far short of their aim.

The experience in Maryland in this respect has not been peculiar, for the course of ostreiculture has never run smooth. The very first operations in this line of which we have any knowledge met with opposition from persons who considered them an encroachment upon public customs. These operations were prosecuted in Rome about two thousand years ago, and Pliny, who wrote much concerning oysters, makes the following reference to them:

> The first person who formed artificial oyster beds (*ostrearium vivoria*) was Sergius Orata, who established them at Baiæ in the time of L. Crassus, the orator, just before the Marsia war (*cir.* B. C. 95). This was done by him, not for the gratification of gastronomy, but of avarice, as he contrived to make a large income by this exercise of his ingenuity. * * * He was the first to adjudge the preëminence for delicacy of flavor to the oysters of Lake Lucrinus, for every kind of aquatic animal is superior in one place to what it is in another. * * * The British shores had not as yet sent their supplies at the time when Orata thus ennobled the Lucrine oysters. At a later period, however, it was thought worth while to transport oysters all the way from Brundisium, at the very extremity of Italy; and in order that there might exist no rivalry between the two flavors a plan has been recently hit upon of feeding the oysters of Brundisium in Lake Lucrinus, famished as they must naturally be after so long a journey. *

A certain Considius thought, however, that Orata was encroaching too much on public property in his operations on the shores of the lake, and the latter was compelled to resort to the courts to defend his created industry.

It is apparent that the early legislators of Maryland had some conception of the possibilities of extending the oyster industry by encouraging private enterprise in planting, for the legislation on this subject dates back to 1830, this being the third State of the Union to recognize private ownership in planted oysters. This recognition was provided in an act dated February 16, 1830 (L. 1829–30, ch. 87).

This act, the groundwork of all subsequent legislation in Maryland on this subject, was in substance as follows: Any citizen of the State was authorized under certain regulations to appropriate in any of the bays or creeks situated within the county of which he was a resident an area or areas, not exceeding 1 acre in extent, for his exclusive use in planting or growing oysters or other shellfish, the said location to

* Nat. Hist., vol. VI, p. 469, ed. Bohn.

be not an oyster bed and to be distinctly defined by stakes or other proper marks, and to be described under oath, said description to be recorded in the office of the clerk of the circuit court of the county. The right to the location ceased on the failure of the preëmptor to each year deposit thereon "sufficient oysters or other shellfish to preserve the growth of the bed." The owner of lands bordering a creek not exceeding 100 yards in width was also given exclusive right to use the same for a similar purpose; and the unauthorized removal of oysters from any of these preëmpted areas was declared a misdemeanor.

While New Jersey and Rhode Island were in point of time ahead of Maryland in authorizing the planting of oysters, yet the regulations adopted by the latter conform more to the present recognition of the needs of a planting industry.

The following list of dates showing the time of the recognition or granting by legislative enactment in each of the United States of some form of private right in planted oysters is of interest:

Rank.	State.	Date.	Reference.
1	New Jersey	1820, June 9	L. 1820.
2	Rhode Island	1827, October	L. 1827, ch. 5.
3	Maryland	1830, February 16	L. 1829–30, ch. 87.
4	Connecticut	1842, June 10	L. 1842, ch. 38.
5	Massachusetts	1845, March 17	Private L. 1845, ch. 138.
6	South Carolina	1847, December 17	L. 1847–48, ch. 3024.
7	Delaware	1849, February 28	L. 1849, ch. 414.
8	Virginia	1849, March 16	L. 1848–49, ch. 125.
9	Maine	1849, August 15	L. 1849, ch. 142.
10	California	1852, April 28	L. 1851–52, ch. 117.
11	Georgia	1856, February 18	L. 1855–56, ch. 8.
12	Mississippi	1856, March 11	L. 1856–57, ch. 95.
13	New York	1859, April 18	L. 1859, ch. 468.
14	Oregon	1862, September 27	L. 1862.
15	Alabama	1872, February 28	L. 1871–72, ch. 28.
16	Washington	1873, November 5	L. 1873.
17	Texas	1879, March 8	L. 1879, ch. 28.
18	Florida	1881, January 29	L. 1881, ch. 3615.
19	North Carolina	1883, March 9	L. 1883, ch. 332.
20	Louisiana	1886, July 8	L. 1886, ch. 106.

There are official records in many of the Maryland counties, and particularly in Somerset, indicating that some of the residents immediately availed themselves of the privilege of preëmpting planting-grounds, but no data exist to show that the planting attained any commercial extent.

In 1842 (L. 1841–42, ch. 270) further provision was made for oyster-planting in this State, and citizens owning lands lying on any navigable waters, the lines of which included any cove or portion of such waters not navigable by licensed vessels, were given absolute right to all deposits of oysters or other shellfish that might be made by them thereon, and by act of 1846 the provisions of this law were extended so as to cover navigable waters similarly situated.

In 1843 (L. 1842–43, ch. 4) an act local to Worcester County was passed authorizing any resident of that county to preëmpt 2 acres of ground in Parker Bay, situated within the limits of Worcester County, and after having said area properly surveyed and the notice of preëmption recorded among the county records, to hold the same for planting oysters or other shellfish for a period of five years from the date of the act; and persons unlawfully removing oysters from such preëmpted areas were guilty of theft. But in 1845 (L. 1844–45, ch. 163) the foregoing act was repealed and in 1846 (L. 1845–46, ch. 40) an enactment was passed identical to the one of 1843, except that the limit of preëmption was fixed at one acre instead of two.

The act of 1865 (ch. 161), by which was adopted the oyster-license system, affected to some extent the planting regulations by increasing the limit of preëmption to 5 acres, but it required the preëmptor to be a resident land-owner. Thus each of the three provisions authorizing persons to plant oysters required the preëmptor to be the owner of lands on the foreshores. But in 1867 the provision authorizing the preemption of 5-acre lots was extended (taking effect January 1, 1868) to any citizen without reference to his ownership of lands bordering the water.

As the regulations expressly forbade the preëmption of natural reefs, many locations after being planted on at much expense were, even after a lapse of two or three years, claimed by the oystermen to be natural beds, and were thereupon thrown open for the use of the public. This resulted in some hardships and in much ill-feeling between the planters and the neighboring oystermen. In order to remedy this the general assembly provided in 1874 (ch. 181) that six months' peaceable and legal possession should constitute a good and sufficient title to the ground so far as was authorized by previous enactments, even though such location should be a natural reef, and in 1884 peaceable possession for twelve months was required.

By act of 1876 (ch. 277) an exception was made to the general planting law and each citizen of Worcester County was authorized to preëmpt of the barren grounds within the waters of that county an area not exceeding 5 acres for oyster-planting purposes, and to hold the location by keeping it plainly marked with bushes, stakes, or buoys, without being required to record a description thereof.

The act of 1890 (ch. 269) provided an elaborate planting law for Somerset County, in which the appointment was authorized of a body to be known as "oyster commissioners," who should, when requested so to do, examine and determine whether a desired location is a natural oyster-reef. Further provision was made in reference to fees to be paid, transfer of title, etc., also the following: "It shall not be lawful for any person or persons to locate or appropriate any water or bottom thereunder for the purposes set forth in this act, where the said bottoms are grassy or suitable for the catching of crabs." But this entire act was repealed at the next session of the general assembly (L. 1892, ch. 662) and the general planting law was reëstablished in that county.

It was provided by act of 1888 (ch. 505) that in case of the death of the preemptor of a lot his executors or administrators should have exclusive use of the location for three years. Prior to that enactment the lot and the oysters thereon reverted to the public immediately on the death of the owner, so far as the law was concerned, but in practice more liberality prevailed. A regulation local to Kent and Queen Anne counties was enacted in 1890 (ch. 333) permitting a preëmptor in case of insolvency to assign his lot for a period of three years. Except under one of these two provisions no authority at present exists for a transfer of title to an oyster-planting lot in Maryland.

From a perusal of the foregoing it is observed that the only changes of material value made in the planting regulations of this State since the original enactment of sixty-three years ago is an extension of the preëmption limit from 1 to 5 acres.

Except in Worcester County, in which the previously mentioned local enactment of 1876 is in force, the oyster-planting law now operative in Maryland is as follows:

The owner 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 his own land; and any owner 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 lands one lot of 5 acres for the purpose of protecting, preserving, depositing, bedding, or sowing oysters or other shellfish; any male citizen of full age of this State shall have power to locate and appropriate and hold one lot of 5 acres, and no more, in any waters in this State not located or appropriated: *Provided,* Thirty days' notice, in writing, shall be given the owner or occupant of land bordering on said waters proposed to be located, that the owner or occupant may have priority of claim; and if such owner or occupant 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 anyone, under the provisions of this section: *Provided, also,* That the said location or appropriation shall be described by stakes, bushes, and with the name of the owner on a board fastened to a pole or stake on or within the appropriated oyster land, or by other proper and visible metes and bounds, which description shall be reduced to writing, under the oath of some competent surveyor, and recorded at the expense of the party locating or appropriating the same, in the office of the clerk of the circuit court for the county wherein such land may be located: *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 twelve months' peaceable possession of all locations of oyster-grounds under the laws of this State shall constitute a good and sufficient title thereto; but should anyone within twelve months 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 for the county where such question shall arise, who, after having given notice to the parties interested, shall proceed to hear the testimony and decide the case; and if his decision be in favor of the party locating said 5 acres, said decision shall be recorded with the original record of said 5 acres, and shall in all cases be conclusive evidence of title thereto: *Provided also,* That if any stakes or bushes used as bounds shall be removed by accident or design it shall not excuse any person from wrongfully taking such oysters if he knew the grounds to have been located and appropriated; but any title or pretended title to more than 5 acres, or otherwise contrary to this section, held or claimed by any person is hereby declared to be fraudulent and void: *Provided,* That no non-resident of this State shall be entitled to avail himself of the provisions of this section, whether he be sole or part owner of any land in this State; and in case of the death of any citizen who may have located and appropriated any lot under the provisions of this section his executors or administrators shall have the exclusive use, possession, and control of such lot as fully as the person so dying had for the purpose of protecting, cultivating, and removing the oysters planted on said lot for the period of three years from the date of the death of the person appropriating such lot; and any person committing a trespass upon said lot, or taking oysters bedded thereon, without the consent of such executor or administrator, shall be liable to the penalties imposed by this article for taking bedded oysters.

If any creek, cove, or inlet, not exceeding 100 yards at low water in breadth at its mouth, make into the lands, or if any creek, cove, or inlet of greater width than 100 yards at low-water mark, make into the lands, the owner or other lawful occupant 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 other lawful occupant 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; and in all such cases such right of the riparian proprietor shall extend to the middle of such creek, cove, or inlet.

That it shall be unlawful, without authority from the owner, for any person or persons to take or catch planted or bedded oysters, knowing them to be so planted or bedded, or to remove, break off, destroy, or otherwise injure or alter any stakes, bounds, marks, buoys, or other designation of any said beds; any person or persons violating the provisions of this section shall be guilty of a misdemeanor, and on conviction before a circuit court or a justice of the peace for the county where the oysters were bedded, shall be fined not less than $10 nor more than $200, or be sentenced to the house of correction for a term of not less than three months nor more than one year, at the discretion of the judge or justice trying the same.

Planting lots preëmpted.—Prior to the enactment of 1867 comparatively few preemptions of lots had been made either under the 1-acre law of 1830 or the 5-acre law of 1865, and the title to most of those had been permitted to lapse. It is doubtful if more than 350 acres had been located in the State at the time of the aforementioned

enactment. Some of the lots were located as early as 1830, this being the case in Somerset County particularly, while in Worcester County the greater number of the preemptions were made between 1840 and 1850. Immediately following the adoption of the 5-acre regulation of 1867, and each year thereafter, a number of locations were and have been made.

The following table, compiled from the various county records, exhibits the area of ground preëmpted during each year in each of the counties of the State:

Table exhibiting by counties the number of acres of oyster-planting ground preëmpted annually in Maryland.

Years.	Somerset.	Wicomico.	Dorchester.	Talbot.	Queen Anne.	Kent.	Anne Arundel.	Calvert.*	St. Mary.	Charles.	Worcester. †	Total.
1868 and prior	237	.....	40	35	.....	.....	.....	.....	24	.....	80	416
1869	61	.....	9	3	.....	.....	.....	.....	8	.....	.....	81
1870	159	.....	18	7	5	.....	15	.....	12	.....	.....	216
1871	369	.....	243	.....	.....	.....	.....	.....	16	.....	.....	628
1872	131	.....	58	35	.....	.....	.....	.....	12	.....	.....	236
1873	118	.....	36	49	24	.....	.....	.....	32	.....	2	261
1874	106	.....	27	42	5	.....	.....	.....	24	.....	2	206
1875	86	10	99	7	10	.....	.....	.....	4	.....	.....	216
1876	106	5	9	3	8	.....	.....	.....	8	.....	.....	139
1877	168	5	.....	3	.....	.....	.....	.....	12	.....	.....	188
1878	12	2	31	.....	39	.....	10	.....	.....	.....	.....	94
1879	159	5	108	3	.....	.....	19	.....	28	.....	.....	322
1880	24	97	54	21	110	.....	5	.....	53	.....	.....	364
1881	.....	60	144	63	5	.....	.....	.....	12	.....	.....	284
1882	.....	.....	42	31	.....	.....	11	20	94	.....	.....	198
1883	20	35	27	24	7	4	13	42	53	.....	.....	225
1884	266	.....	31	10	.....	.....	24	20	86	.....	.....	437
1885	377	84	40	3	3	5	12	10	4	.....	.....	538
1886	426	65	45	7	.....	.....	4	12	4	.....	.....	563
1887	131	64	.....	7	.....	11	17	.....	8	.....	.....	238
1888	32	25	18	10	.....	.....	15	.....	16	.....	.....	116
1889	36	50	40	7	5	5	8	.....	12	.....	.....	163
1890	82	.....	180	21	15	.....	16	89	28	.....	.....	431
1891	336	40	130	45	56	14	28	113	12	.....	.....	774
1892	167	30	325	32	23	20	8	50	20	.....	.....	675
Total	3,609	577	1,754	468	315	59	205	356	582	.....	3,084	11,009

* Records of Calvert County prior to 1882 were destroyed by fire.

† About 3,900 acres held under law of 1876, ch. 277, without filing papers.

Notwithstanding all this ground was ostensibly preëmpted for the planting of oysters, only a small part of it is now in actual use for that purpose. In fact, a large portion of it has never been used for planting purposes and was not appropriated with that object in view, many lots being located by the owners of the adjacent estates in order to prevent outsiders from operating on the margin of their property.

Some of the lots have, through error or otherwise, been located two or more times, and the descriptions filed are not always such as would give a surveyor a correct understanding of their locations, they frequently surrounding the lots with almost every impossible engineering description.

The scene of the most extensive oyster-planting in Maryland is not in the Chesapeake region, but on the shores of Worcester County in the Sinepuxent Bay. This is the only water area in Maryland not tributary to the Chesapeake, being on the ocean side of the Eastern Shore or "Mavirdel" peninsula, and emptying directly into the ocean. The planting of oysters in these waters originated on a small scale in 1842; but the extent on which it was then conducted was almost insignificant, the product being utilized entirely in the local trade.

About 1875 the rapidly diminishing product of the public beds in these waters led to an extension of the planting industry, which quickly increased until 1880, which was probably the most successful season known in the planting industry of the county as regards the profits of the persons engaged. From that time the industry decreased

in extent because of the increasing mortality each year among the oysters planted. This may to some extent have been due to their overcrowded condition and a lack of sufficient food, but more likely to the malaërated condition of the water and the large amount of vegetable and mineral sediment in the bay.

The industry is still prosperous and conducted with as much energy, although probably not with so much care, as in any of the Northern States. The seed oysters are obtained from the natural reefs in this county, the ocean shore of the counties of Accomac and Northampton, Virginia, and the tributaries of the Chesapeake. The cost delivered on the grounds ranges from 15 to 45 cents per bushel, according to the quality and the locality whence obtained. About 250 to 550 bushels are planted to the acre, and they are permitted to remain from one to three years. While each person is authorized to preëmpt only 5 acres of ground, yet a number of the members of a family or of a community unite and obtain a sufficient area for engaging in the industry on a profitable scale. The annual product of that part of the bay situated in Maryland has averaged during the last six years about 135,000 bushels annually, at 90 cents per bushel clear.

The extent of the product varies much from season to season, and in 1887–88 and 1889–90 was more than twice the average, the product during each of the two seasons named being about 200,000 bushels at $1 per bushel. In 1891–92 the yield was 86,000 bushels, and in 1892–93 it was 105,600 bushels. These oysters usually go upon the markets as "Chincoteagues" or "Parker Bays."

There exists a regulation local to Worcester County in respect to the preëmption of planting areas that is, I believe, without a parallel in any part of the world. This regulation is in substance as follows: If through ignorance or mistake the locator of a planting lot should preëmpt a natural oyster-reef, the county commissioners are required, upon sworn information thereof being presented to them, to appoint three disinterested men to go with the locator, examine the lot, and report under oath relative to the same. If in the preëmpted area a reef more than 20 feet square in any one place be found they shall value the same and the locator shall pay the valuation to the county and also the expenses of the examining committee, the latter not to exceed $10; but if no reef more than 20 feet square be found the expenses of the committee shall be paid by the informer.

The utmost harmony, however, prevails among the oystermen of that region, and their operations are guided as much by public sentiment as by the statutes; hence no advantage has been taken of the opportunity here presented by collusion with one another for obtaining the natural reefs of that county.

In the Chesapeake region of Maryland, bedding is practiced more extensively in the Patuxent River than elsewhere. The "plants" are obtained from the public reefs in that river and are permitted to remain on the private areas for a few weeks or months, being deposited during a dull season and taken up when the oyster market is strong. Occasionally, however, they may remain on the private grounds for a year or more. The object in bedding is not so much to increase the size or condition of the oysters as to obtain a better market; and the expressions "storing" and "dumping," sometimes heard in the Chesapeake, express better than "bedding" the operations in this river. The quantity removed from these areas may approximate 100,000 bushels annually, but this is a product of the public reefs rather than of the planting lots.

While the preëmption of oyster-planting grounds in the Tangier and Pocomoke

regions dates back to 1830, yet the bedding of oysters has never been vigorously or extensively conducted there, and what has been done was on an experimental rather than an industrial scale.

In Fishing Bay, on the southern shore of Dorchester County, the bedding has been of noticeable extent since 1871. The seed oysters, which are obtained from Tangier Sound and tributaries, cost from 10 to 20 cents per bushel and are permitted to remain one or two years. There is much complaint, however, that the risks from loss by unauthorized removal are very great, and there is little doubt that this practice has been of extreme detriment to an extension of the business.

Preëmptions were made in Somerset County as early as 1830, and occasionally oysters would be bedded on the areas located, but usually for only a few weeks. From 1870 to 1875 a number of persons were sufficiently interested in the subject of oyster-planting to attempt to make more extensive use of their lots, but little resulted from it. In 1884 and 1885 the subject was again revived in this county, and scores of lots were located. Those persons making use of their reservations planted the small oysters of Tangier Sound, costing, delivered on the beds, 10 or 15 cents per bushel, the size of the oysters ranging from that of a twenty-five-cent piece up to a silver dollar, but, being the "run of the rock," were mixed with considerable shells and débris. Col. T. S. Hodson, of Maryland, has furnished the following data in reference to these operations:

By October 1, 1885, the small oysters bedded in March of that year had become sufficiently large for shucking purposes, ranking as "straight-ups," with from one-fourth to one-third "selects" among them, worth 30 cents per bushel on the ground, while the quantity had increased threefold. Could they have remained another year, so as to acquire their full size, the profits to those who had planted them would have been very great. But an organization had been formed which determined to put an end to this new source of labor and profit. Some persons went in a body upon John H. Whealton's bed and began to take the oysters, but he opened on them with a shot-gun, and the attempt soon ended. They took a few of the oysters bedded by James C. Nelson, who begged them to desist, which they soon did. A suit was instituted to vacate a certain lot as a natural oyster bed, on the ground that wherever scattering oysters could be found it was a natural bed. The court, however, found that there were less than 100 bushels on the 5 acres, and dismissed the suit.

As a consequence to the hostility thus exhibited, the planters determined to immediately realize on the oysters they had bedded, instead of waiting for a larger profit during the second season. They therefore hired men to take them up, paying 10 cents per bushel therefor, thus employing much labor that would otherwise have been idle. Some of the planters did very well. Mr. Green took up 1,700 bushels in December, and sold them for 62 cents per bushel. Mr. James C. Nelson and Mr. R. N. Horsey, using a portion of 10 acres in Pocomoke Sound, have furnished the following statement of financial operations on that area in 1885–86:

Amount paid for 5,500 bushels seed oysters planted March, 1885, at 10 cents per bushel delivered	$550.00
Paid for taking up and marketing oysters in 1885–86	630.00
Total	1,180.00
Received from oysters sold in December, 1885	1,403.50
Received from oysters sold in spring, 1886	277.00
Total	1,680.50
Profit in 12 months=$500.50.	

After the oysters were sold in Crisfield, about $600 was paid for shucking them, and as all public-reef oysters obtainable were then being purchased to fill orders, this $600 was so much that the laboring class would never have received had these men not planted an oyster. Thus, from a little lot of $550 worth of oysters, the labor around Somerset County received for oysters planted, $550; for taking up oysters, $630; for shucking, etc., $600; total, $1,780. Since then fewer persons have planted oysters, and the majority of those have lost so heavily by depredations, during the daytime as well as at night, that they are almost discouraged.

An interesting attempt was made in 1890 by Messrs. C. A. DuBois & Co., oyster-dealers of Annapolis, to grow oysters on 10 acres of very muddy ground situated in the Severn River in Anne Arundel County, and during June of that year about 5,000 bushels of oyster shells were planted at a cost of $250. A set was obtained on these shells during the ensuing spawning season, and in the winter of 1891–92 about 3,000 bushels of oysters were taken from this area and marketed at 45 cents per bushel, and about 500 bushels were left on the bed to be removed later. In 1891, 5,000 bushels of shells and in 1892 10,000 bushels were planted on this area, but the set obtained was very poor.

The areas of ground situated within creeks less than 100 yards wide or within the lines of other property along the foreshores is exceedingly small, and the bedding of oysters in those areas is so insignificant in extent when compared with the extensive common oyster fishery of the State as to scarcely merit attention. A few such areas are situated in St. Mary and Calvert counties, and probably some in Talbot, Dorchester, and Somerset counties; but the quantity of oysters marketed from those private holdings scarcely exceeds 25,000 bushels annually, and nearly all of that was originally obtained from the public reefs.

It is thus observed that, except what is done in Dorchester County, even the simplest and most primitive modes of oyster-culture, the planting or bedding of small oysters, is an almost entirely undeveloped resource in Maryland; and in no sense of the word as used at present is the small bedding done in the Chesapeake a cultivation, and the expression "storing" or "dumping" well illustrates it. A farmer may as well plant his corn without first having prepared the ground and then without further care or attention or protection from birds or other animals expect to gather a harvest. He will be fortunate if able to gather as much corn as he planted, and so may the oyster-man if able to take up as many oysters as he deposited.

Among the factors that have retarded the development of oyster-culture in this State might be mentioned the following: The area that a person is permitted to hold is so small that under the most favorable conditions the planter can afford to devote only a small portion of his time to it; the tenure is very uncertain and liable to be affected without notice by a change in the law or the administration thereof; the distinction between a natural reef and a barren bottom is so indefinite that after much attention has been paid to a lot, it is likely to be declared a natural reef, and as long as this condition of the ground is debatable planting thereon is an enterprise of great risk. It requires an investment of energy and labor to properly engage in oyster-culture, and these hesitate to touch the lots under the present impossibilities of enlargement and the insecurity of tenure. The uncertainty as to what are natural grounds has also encouraged certain persons to attempt to locate areas popularly supposed to

come within that classification, in the hopes that under cover of the general sympathy being aroused in favor of the planters their scheme may prove successful.

What is desired is that the general assembly directly or indirectly determine specifically and precisely by metes and bounds what areas are open for location, permit the preëmption of sufficient area to justify a person in devoting his attention to it, and settle the tenure for a specified period of time.

But there is a trouble greater than all the foregoing factors combined, and that is the lack of protection to the oysters from being removed by persons refusing to recognize private ownership in bedded oysters. The lots are so small that they do not warrant the expense of the watchmen employed in other planting localities. Practically all the oysters may be removed from a lot in one night, and it is almost impossible to convict the offenders, it not being possible to identify the stolen goods. If apprehended and arrested and the removal of the oysters proven, a question then arises as to the location being a natural reef. But even if the offender be convicted, which is not usual, he is guilty only of a misdemeanor and may escape with a fine of from $20 to $200, while the value of the property obtained may have been many times that amount.

Confronted by these conditions, the oystermen who would otherwise engage in planting prefer to sell their small oysters for whatever they may bring rather than risk the uncertainties of harvesting a planted crop and endure the accompanying contentions with their neighbors.

The planting law of Worcester County is quite similar to that operative in the Chesapeake region. The area of preëmption is limited to 5 acres, the planters have no security of tenure, and they do not locate natural reefs. But there is this distinctive difference: the person unlawfully removing oysters from private areas in that county is guilty of felony, punishable with imprisonment in the penitentiary for from one to two years; and under the good influence of this provision, backed by a popular sentiment favorable to the planters, much of the bedding resources of the waters of that county are utilized, notwithstanding the small encouragement given by the general assembly.

The State as an oyster farmer.—The feeling is current among certain classes in Maryland that if the cultivation of oysters within the waters of that State be practicable the work should be undertaken by the State at large or by counties for the benefit either of the people of the State in general or of the counties respectively. Giving practice to this theory, a number of procedures have been authorized by the general assembly for improving the productiveness or increasing the area of the public beds.

The first attempt in this line was made in 1874 (ch. 77), when the county commissioners of Worcester County were authorized to expend all the revenue derived from the issuing of tonging licenses in that county in the purchase of seed oysters to be planted in the Sinepuxent Bay. The total amount of revenue derived from this source up to the present time has amounted to $4,690, but only a portion of it has been devoted directly to the purposes noted, and this mainly for planting small seed or the "run of the oyster rocks" during those years immediately following the enactment, the county commissioners being merely authorized and not required to purchase the seed oysters. During recent years few oysters or shells have been bedded on the public reefs by that county, the money being expended indirectly for the benefit of the oyster industry, as in cutting a canal, the building of necessary landing facilities, etc.

The revenue from this source is a sort of a contingent fund upon which to draw when special public expenditures are deemed necessary for the good of the oystermen.

By act of 1884 (ch. 255) the county commissioners of Somerset County were authorized (but not required) to utilize the revenue derived from the issuing of scraping licenses in that county to vessels measuring over 10 tons in the purchase and planting of shells on the public grounds within the county limits. The said commissioners were also empowered to make such regulations as might be necessary to protect the areas so improved; and it was further provided that "in case the general assembly shall provide for the sale or lease of oyster-grounds for the propagation of oysters the said county commissioners may buy or lease the said waters of said county for the use of the people thereof." This was a very ambitious undertaking, and except the very small operations in Sinepuxent Bay during those years immediately following 1874, as just noted, but which do not furnish a comparison, it was and is yet without a parallel in any part of the world—the annual expenditure of a large sum of public money in the cultivation of oysters on the public domain for the use of a common fishery. The sum available for this purpose then amounted to about $4,000 annually, but was rapidly increasing, and the area of the ground upon which operation was authorized approximated 180 square miles, covered with 60 square miles of oyster beds. The authority given the county commissioners at their discretion to permit or interdict oystering on the improved reefs is particularly noticeable, especially when it is considered that that is the principal oyster region of the greatest oyster-producing estuary in the world, and that in no other locality in America are the inherited privileges or customs of the common fishery more zealously guarded.

An effort was made by the county officials to properly enforce the intentions of the enactment. Quantities of shells were planted and a special police was provided for protecting the areas improved. But within a few months the county court expressed an *obiter dictum* that the provision for excluding the oystermen from those areas was not sufficiently explicit, and the police protection was withdrawn. At the next session of the general assembly (1886) the law was amended so as to meet the views expressed by the court; but in the meantime a change had been effected in the personnel of the county commissioners, and the new board, using their discretion in the matter as the law permitted, failed to exercise the authority given them. In 1888 the regulations, which had then been inoperative for three years, were repealed by the assembly.

By act of 1886 (ch. 314) an appropriation of $5,000 was made to be used by the commander of the State fishery force in the purchase and depositing of shells in May and June of that year in such places in the Chesapeake as that official might deem suitable for the purpose of obtaining thereon a "set" of oysters. For some cause the planting was delayed until the latter part of June, and as the spawning season was then almost over the undertaking was not a success. Indeed, had the shells been planted earlier the result might have been practically the same, for the set obtained in other portions of the bay during that year was not abundant. This was intended only as an experiment and not as the inauguration of a State policy. A similar experiment made by the State of Delaware in 1891, at an expense of $2,000, has, it is reported, resulted very satisfactorily.

TRANSPORTING.

History, etc.—The centering of the oyster trade for convenience of labor, shipment, etc., at Baltimore or other populous or railroad points, the location of the reefs many miles distant in the lower and tributary waters of the bay, and the necessary use of many small boats in the fishery, require the employment of a large number of vessels for transporting the catch from the reefs to the marketing-houses. As the State has exercised no supervision over these vessels, the data at hand for exhibiting the extent of this branch of the oyster industry are incomplete. As no license and no peculiar facilities other than those enjoyed by vessels engaged in general coasting trade are required, a number of vessels engage in transporting oysters for only a short time during the busy part of the season, and estimates are therefore likely to differ considerably.

In 1880 Mr. R. H. Edmonds, whose report has already been referred to, estimated that 200 vessels, employing 800 men, were engaged in transporting oysters in Maryland. But this was probably very much less than the actual number, as will be seen from the following incident: In 1884 (ch. 518) a law was enacted requiring all vessels engaged in transporting oysters to obtain a license on the same terms and conditions and at the same rate ($3 per ton) as was required of the vessels engaged in dredging, and a tax of 3 cents per barrel was imposed on all steamers carrying oysters while engaged in a regular freighting business. Of the transporting vessels 353, not engaged in dredging, paid the fees in order to continue the trade. A few vessels, however, opposed the payment of the tax, and their case being taken to the courts the law was declared unconstitutional, and the fees paid by other transporters, amounting to $27,644.15, were refunded. This indicates that there were about 400 transporting vessels during that season. The increasing number of market-houses at the ports down the bay and near the reefs, competing with and naturally decreasing the oyster trade of Baltimore, has during the last eight or ten years resulted in a corresponding decrease in the number of transporting vessels. But during the last three years the decreasing extent of the dredging industry, together with the large quantity of oysters taken by the tongmen and scrapemen, has resulted in an increase in the number of the transporting vessels. In 1889–90 the number was 351, the tonnage of which was 11,801.43. In 1890–91 this was increased to 399, with a tonnage of 13,111.45, and in 1891–92 it was further increased to 456, with a tonnage of 15,067.29, nearly equaling the tonnage employed in dredging.

The vessels.—The transporting vessels differ little from those employed in dredging. There are no very small craft among them, and their average measurement is much greater than that of the dredging vessels, the tonnage of the former being about 33.5 tons, and of the latter about 22 tons. The largest of the transporters are the *E. S. Johnson*, 85.7 tons, built in 1882, and the *Clemmie Traverse*, 81.05 tons, built in 1885. The average value of the transporting vessels is about $1,500; the original cost, however, was about twice that amount. During the summer the greater number of these vessels are engaged in transporting farm produce and general freight to and from various points along the shores of the bay and tributaries. The fluctuations from year to year in the number of vessels transporting oysters is to some extent governed by the prosperity of the dredging industry. If that branch of the oyster fishery gives indications of being profitable during a certain season, a large number of vessels obtain a

license and engage in dredging; if the contrary be the case, the vessels are confined to transporting.

The men.—The men employed on the transporting vessels are usually residents of the State, and in most cases depend upon the freighting trade of the Chesapeake Bay for a living. The captain is usually on shares, and clears about $40 to $80 per month, while the laborers are on wages, receiving from $20 to $30 per month and board. The transporting vessels are successful in obtaining much better crews than the dredging vessels.

Profits and extent.—The captains of the transporting vessels purchase the oysters outright from the men catching them. The "buy boats" lie at anchor near the fishing fleet, with a basket at the masthead, or some other signal to indicate that oysters are being purchased, the latter being delivered as the oystermen finish their day's work. The profits made in transporting oysters are quite irregular, depending on the ability of the captains in striking a poor market "down the bay" and a good one in the city. During the cold weather in January, 1893, several vessels purchased oysters at 70 cents, and by paying heavy towage fees to Baltimore succeeded in obtaining $1.45 per bushel. But this was very exceptional, the gross profits throughout the season averaging 12 to 15 cents per bushel, an average for the fleet of about $900 per vessel.

The following table exhibits the extent to which vessels have engaged in transporting during certain recent seasons:

Years.	Vessels.			Outfit.	No. of men.	Gross profits *
	No.	Tonnage.	Value.			
1889-90	351	11,801.43	$536,135	$53,793	1,260	$350,000
1890-91	399	13,111.45	569,000	59,190	1,444	370,000
1891-92	456	15,067.29	653,235	72,290	1,651	400,000

* This represents the enhancement in value of the oysters transported.

Transporting trade with other States.—The preceding data relative to the transporting branch of the oyster industry do not include the large number of vessels owned elsewhere than in Maryland but engaging in transporting oysters from the waters of that State to other markets and to planting-grounds. From 1840 to 1870 this trade was very extensive, Cape Cod and Connecticut vessels being the principal ones interested, but vessels from Philadelphia, New York, and elsewhere were also employed. Barnstable and Wellfleet, Mass., alone had about fifty vessels engaged in this trade. They cost about $6,000, and carried about 2,500 bushels of oysters, four to eight voyages being made each spring. The transportation charges were about 15 cents per bushel, but during the civil war it went up to 25 cents. It is reported that one Cape Cod captain made 138 oyster trips to the Chesapeake before he was 40 years of age. This trade purchased oysters in Virginia as well as in Maryland.

These vessels now probably number sixty, averaging about 50 tons in measurement and $3,000 in value, with five men to each. They are usually employed but a few weeks in the spring, and the number is not half of what it was fifteen or twenty years ago, as the extensive development of private oyster beds in Northern States and the constantly increasing prices of the Chesapeake oysters are rendering their northern planting unsuccessful from a financial point of view.

Some of these transporting vessels go around Cape Charles, and the remaining pass through the Chesapeake and Delaware Canal. No reliable data are available to show the extent of the trade through the "capes," but by courtesy of Mr. T. J. Cleaver, collector of the Chesapeake and Delaware Canal Company, I am enabled to present the following tabular statement, exhibiting for a period of years the quantity of oysters passing through that canal:

Chesapeake and Delaware Canal, east-bound shipments.

Year.	Bushels.	Year.	Bushels.
1880	939,600	1890	60,340
1881	485,385	1891	129,660
1882	650,100	1892	228,055
1883	552,227	1893	252,423

About one half of these oysters pass through the canal during the last four or five weeks of the spring fishing. While a few of them go at once into the food markets, by far the greater portion are planted on the private grounds in Delaware Bay. Their average cost in Maryland probably does not exceed 25 cents per bushel, and at times it is very much lower than that, many vessels loading at 15 and 20 cents per bushel. After remaining planted in the Delaware Bay one or two years they are marketed at 75 cents to $1 per bushel. As oysters can not be safely transplanted during cold weather their movement is delayed until spring, and the date of the beginning of the close season determines largely the quantity transported for planting, this being very much greater before the adoption of the close season on tonging than at present.

Capt. Samuel M. Travers, formerly commander of the fishery force, submits the following as an exhibit of the quantity of oysters shipped North for planting purposes during the spring of 1879:

Shipped from—	Bushels.
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 shore	112,500
Patuxent River and tributaries	150,000
Potomac River and tributaries	625,000
Total	2,178,750

The average price paid is reported by him to have been 7 cents per bushel.

In 1880 the beginning of the close season was changed to April 15 so as to restrict this trade, with the result of reducing it during the ensuing season to about 1,000,000 bushels. One of the chief objects of the present close time in the spring is the restriction it places upon this transporting of seed oysters from the State.

THE OYSTER MARKETS.

General notes.—This branch of the oyster industry employs more capital than the fishery and about one-half as many persons. Baltimore is not only the most extensive oyster market in the State, but also in the world. About thirty years ago the trade in the Chesapeake was almost exclusively centered in that city, but the increased rail road facilities at the smaller ports along the bay shores have led to the establishment of many markets nearer the reefs. Crisfield, although handling scarcely one-fourth so many as Baltimore, now ranks second in extent, and following in order are Cambridge, Oxford, Annapolis, St. Michael, and many smaller places. Large quantities of oysters are also landed at other cities and towns situated on the tributaries of the Chesapeake Bay and there sold to retail dealers and consumers without passing through large shucking-houses. Among these places may be mentioned Washington, D. C., Alexandria, Va., Easton, Port Deposit, Chestertown, Salisbury, and Pocomoke, Md.

The marketing trade is divided into three branches, viz, the shell-oyster or barrel trade, the raw-shucking trade, and the steaming trade. Of these the raw-shucking branch is the most important, both as regards the quantity of oysters handled and the number of persons employed. Next in extent ranks the steaming trade, which is located entirely at Baltimore, at which place is prepared over nine-tenths of the world's product of steam-canned oysters. Occasionally small steaming-houses have been operated at other ports in Maryland, but their product has never been extensive, and during the last four or five years Baltimore has had the exclusive enjoyment of this branch of the trade in Maryland. The marketing of shell or barrel stock oysters is comparatively small in Maryland, and usually no established wholesale houses devote themselves exclusively to this branch of the business.

One of the most fruitful sources of trouble in connection with the oyster-marketing trade is the system of measuring the oysters as they are delivered at the markets. The shucking trade is extensive, but conducted on a small profit by reason of the great competition, and during some seasons a slight variation in the size of the bushel measure used may determine whether a firm may gain or lose by the season's work. As early as 1860 regulations were made to prevent frauds in the measurement, but these were frequently amended or changed, and about the only heritage the industry now has from those enacted prior to 1884 are the regulations for the bushel measure and the provision for licensed measurers. The bushel measure is now required to be an iron tub of the following dimensions: Inside diameter at bottom, 16½ inches; inside diameter at top, 18, and 21 inches diagonal from the inside chime to the top, the same to be even or struck measure. The licensed measurers, each of whom pays $10 annually as license fee, are required to measure all oysters sold in the various ports, receiving for their services the sum of ½ cent per bushel, to be paid equally by buyer and seller. Each dealer may designate such measurer as he desires, as the number authorized is unlimited, and he usually has some one in his employ obtain license and attend to the work, thus saving the measuring fee.

In 1884 (ch. 299) the governor was required thereafter, at each session of the general assembly, to appoint five persons for Baltimore and one person for each of the other oyster ports in the State, who should be known as general measurers of oysters, and whose duty it should be to see that the licensed measurers properly attended to their duty, and that all laws in respect to oyster measuring should be complied with, receiving as compensation 5 cents on each 100 bushels of oysters received, the same to be paid by the seller. This fee was changed in 1886 to 10 cents per 100 bushels.

THE BALTIMORE MARKETS.

Annual receipts.—Baltimore is the principal oyster market of the world. Each year there is handled in that city a quantity about equal to the annual oyster product of all the countries of Europe and one-fifth as many as are handled in all the rest of the world combined. The following table exhibits for a period of years the quantity received during each season:

Table showing oyster receipts at Baltimore.

Season.	No. of bushels.	Authority.	Season.	No. of bushels.	Authority.
1849-50	1,350,000		1886-87	6,115,275	General measurers.
1856-57	2,610,000		1887-88	5,695,304	Do.
1865-66	3,860,000	C. S. Maltby.	1888-89	5,589,360	Do.
1869-70	5,000,000	Hunter Davidson.	1889-90	5,925,400	Do.
1879-80	6,459,292	R. H. Edmonds.	1890-91	4,393,600	Do.
1884-85	6,273,118	General measurers.	1891-92	5,354,320	Do.
1885-86	6,909,963	Do.	1892-93	4,765,270	Do.

In comparing the receipts as noted in the foregoing statement it is proper, because of the effects of the cull law, to add about 8 per cent to the receipts for 1890–91 and 11 per cent to those for 1891–92 and 1892–93.

In addition to the foregoing there have been landed in Baltimore during each season by the bay steamers about 50,000 barrels of oysters consigned direct to the retail dealers and consumers. Neither do the above figures include several thousand bushels of high-grade oysters purchased annually from Northern planters.

Of the oysters landed at Baltimore in 1890–91 about one-fifth were received from Virginia waters and from Virginia vessels oystering in the Potomac River. The quantity from this source during that season was exceptionally large; generally it is not more than one-seventh or one-eighth of the total receipts. During the last three or four seasons about 25,000 bushels have annually come from North Carolina. Those are about the cheapest oysters transported to Baltimore, selling for 30 to 35 cents per bushel. In addition to the seasonal variations, the quantity of oysters landed in Baltimore varies much from month to month and even from week to week according to the weather, the most favorable being clear and sufficiently cold to prevent catching oysters in more northerly States, but not so cold as to prevent working in the Chesapeake.

The following table shows for each week during the last three seasons the receipts of oysters in Baltimore, except the small quantity of barrel stock landed by steamers:

Table showing weekly receipts of oysters at Baltimore during certain seasons.

Month.	Week of season.	1890-91.	1891-92.	1892-93.	Month.	Week of season.	1890-91.	1891-92.	1892-93.
September	First	35,740	18,150	12,620	January	Eighteenth	137,940	212,080	146,500
	Second	34,750	25,680	26,470		Nineteenth	122,450	198,940	96,220
	Third	51,280	27,080	45,010		Twentieth	185,820	120,110	40,620
	Fourth	76,760	32,320	54,910		Twenty-first	106,410	140,370	20,110
October	Fifth	70,130	43,720	114,970		Twenty-second	174,090	120,090	36,790
	Sixth	123,140	80,830	171,500	February	Twenty-third	156,250	125,610	39,540
	Seventh	151,170	129,980	230,870		Twenty-fourth	137,980	204,050	100,230
	Eighth	132,170	202,050	326,290		Twenty-fifth	124,220	165,910	100,600
November	Ninth	227,820	240,270	300,050		Twenty-sixth	118,430	127,190	125,220
	Tenth	145,490	279,010	190,210	March	Twenty-seventh	70,470	111,110	205,160
	Eleventh	192,710	324,020	269,020		Twenty-eighth	72,450	154,480	186,810
	Twelfth	147,100	309,090	202,560		Twenty-ninth	108,260	107,350	187,500
	Thirteenth	204,030	241,650	190,290		Thirtieth	100,280	108,130	176,290
December	Fourteenth	226,390	283,190	286,580	April	Thirty-first	149,620	171,090	149,530
	Fifteenth	174,200	271,350	230,350		Thirty-second	93,060	154,530	71,480
	Sixteenth	174,210	295,610	242,780		Thirty-third	99,960	77,580	56,150
	Seventeenth	182,050	209,200	127,690		Thirty-fourth	77,150	39,200	4,350
					May	Thirty-fifth	9,620	3,300	.....
						Total	4,393,600	5,354,320	4,765,270

During the last eight years the largest quantity received at Baltimore during any one week was 408,940 bushels, which arrived during the week ending November 17, 1888. The smallest quantity during the busy part of the season for the same period was 20,110 bushels, in the week ending January 21, 1893. The receipts from the 19th to the 25th week were very much less in 1892–93 than for the same period of time for many years, this being due to the exceptionally cold weather restricting the catch, thousands of boats and vessels being "frozen up." Had the receipts during those weeks been equal to those of the corresponding period in the previous season the quantity landed at this port during 1892–93 would have exceeded that of 1891–92 by over 1,000,000 bushels.

The commission sellers.—Practically all the oysters delivered at Baltimore in bulk are handled by men known as commission sellers, who control the sales of nearly all the oyster vessels arriving in that port, and most of whom have been oystermen at some time in their careers. They attend to the financial dealings of the captains in the city, the bargaining and sale of the oysters, and advance money to the oystermen when desired. For their services they charge 1½ cents per bushel, but prior to the season 1891–92 they received 1 cent per bushel of oysters handled. They usually work in companies of 2 or 3 men each, the number of companies being 15, consisting of 34 men and using property valued at $65,000, with cash or credit capital approximating $260,000. By these men the oysters are sold to the various branches of the trade.

Raw-shucking trade.—During the early prosecution of the oyster industry such oysters as were landed at Baltimore and not needed or intended for local consumption were sent by wagons and cars to the neighboring towns in the shell. The first wholesale shucking-house was opened here about 1830, but met with indifferent success and soon abandoned the business. At that time the oyster trade of the country centered about New York City and Fair Haven, Conn., particularly the latter place, at which were marketed native Connecticut oysters as well as the stock obtained by vessels from the Chesapeake. The continued decrease in the native supply in that State, and the consequent increase in cost, indicated that the trade could be more profitably carried on in Baltimore than in Fair Haven, and induced Mr. C. S. Maltby of the latter place to move to Baltimore in 1836 and establish a shucking-house on the plan of those operating in his native town. His trade increased rapidly and, the success being noted, other persons engaged in the business, and within a few years regular lines of oyster wagons were operated, running from Baltimore to the neighboring cities. Those oysters intended for shipment to distant points were shucked and sealed in tin cans or very small wooden kegs, and with care could be preserved for a few weeks, this depending on their temperature. The general use of these small packages, however, was long ago discontinued, and the shipment is now almost entirely in large tubs or kegs holding several gallons.

It is reported that in 1846–47 there were six houses in this trade, utilizing about 250,000 bushels annually. In 1865–66 the oysters utilized in the raw-shucking trade amounted to 1,875,000 bushels. From that time until 1874 the trade rapidly increased in extent, but since the last-named date, on account of the increasing competition with other markets along the bay shores, little variation has existed in the quantity of oysters handled by this branch of the trade at Baltimore. The following table shows the quantity utilized in the raw-shucking trade of that city during a number of seasons.

Baltimore raw-shucking trade receipts.

Season.	No. of bushels.	Season.	No. of bushels.
1846-47	250,000	1887-88	2,893,755
1865-66	1,875,000	1888-89	2,809,120
1879-80	3,769,353	1889-90	3,206,177
1884-85	3,255,095	1890-91	2,331,228
1885-86	3,549,873	1891-92	2,736,342
1886-87	2,975,385	1892-93	2,698,126

At present the number of Baltimore houses engaged in shucking oysters for the raw trade is 58, with property valued at $1,330,000; 10 of these houses, worth $615,000, engage also in handling steamed oysters. One or two of them with the wharf property attached are worth $175,000 and are capable of handling 7,000 bushels of oysters in a day. The number of persons employed in the raw trade is about 3,650, of whom about 3,200 are engaged in shucking. The latter are mostly men, but in some of the establishments large numbers of women find employment. The work is fatiguing and requires strength as well as skill. The men are usually able to shuck more than the women; and while an able male shucker working 12 hours can make $2.25 per day, yet because of the irregular employment the shuckers do not average more than $1.25 throughout the season. The price paid for this labor is 20 cents per "gallon cup," this, as provided by the statutes (L. 1886, ch. 537), holding 9 pints wine measure. The other employés in the raw-shucking trade, numbering about 450 men, are on weekly wages, ranging from $6 to $20 per week, and amounting to about $115,000 during an average season.

In addition to labor items, large expenditures are made for ice, tubs, etc., making the total cost of handling the oysters in the shucking houses about 25 cents per bushel. The total value of the output of the raw-shucking houses of Baltimore during each of the last four seasons has been $2,662,076, $2,373,526, $2,482,000, and $2,625,000, or an average for each bushel of oysters received of $0.83, $1.02, $0.90, and $0.97, respectively.

The steaming trade.—The preserving of prepared foods in hermetically sealed tin cans was begun in this country about 1844, salmon and lobsters being among the first products so prepared. About 1848 a modification of the process employed was extended to the preserving of oysters, they being first cooked in kettles. This is said to have been originated by Mr. Thomas Kensett, of Baltimore, but the trade was developed by Messrs. A. Field & Co., of that city. About 1860 Mr. Lew McMurry began scalding the oysters, and the product of his house enjoyed a high reputation.*

The present method of steaming began about 1864, the procedure then adopted differing from the present in that the oysters were placed in baskets holding about 3 pecks each, and these to the number of about 200 were placed in a large box and there steamed. From the beginning of this trade up to the present time it has been prosecuted almost entirely at Baltimore, probably not 5 per cent of the total quantity of oysters steam-canned in America since 1848 having been prepared in houses outside of that city. From 1860 up to 1875 the steaming business was prosperous, but from 1875 to 1880 reputable firms engaged in this branch of the oyster industry suffered considerably from the operations of certain unscrupulous packers, who by putting up "light weights" injured the reputation of the Baltimore product. Mutual coöperation

* In 1852 a canning house was started by Messrs. Piper and Stetson near Stockton, in Worcester county, but closed after working a few months.

among the packers resulted in a decrease in the fraudulent practice, but it was not entirely broken up until 1884, when the general assembly required (L. 1884, ch. 257) that all persons engaged in steaming oysters should cause to be stamped on each can the true weight of the solid oysters therein, all sales of unstamped oysters to be void. Provision was made for the appointment by the governor of two persons as examiners of the oysters packed, who should see that the law relative to "light weights" was properly enforced. Each person or company engaging in the canning of steamed oysters, as a condition on which they were permitted to carry on the business, was required, at the end of each month, to make a sworn statement to the comptroller of the State treasury of the quantity of oysters steamed, at the same time paying into the State treasury one-tenth of 1 cent per bushel for all so used.

The following statement is presented exhibiting for a period of years the quantity of oysters utilized in the steaming trade at Baltimore:

Baltimore steaming trade receipts.

Season.	No. of bushels.	Season.	No. of bushels.
1865–66	965,000	1888–89	2,570,217
1879–80	2,689,939	1889–90	2,491,088
1884–85	2,745,923	1890–91	1,860,792
1885–86	3,074,770	1891–92	2,396,763
1886–87	2,909,761	1892–93	1,826,428
1887–88	2,591,402		

The number of houses in Baltimore engaged in steaming oysters is 20, valued at $1,255,000; of these, 10 valued at $630,000 engage in handling raw oysters as well as steamed. These houses are all located along the shores of the harbor, and, together with the ground occupied, range in value from $6,000 to $185,000. The quantity of oysters handled by each house varies from a few hundred bushels to 650,000. The smallest quantity handled by any one house in 1889–90 was 631 bushels; in 1890–91, 3,866 bushels; in 1891–92, 7,918 bushels; and in 1892–93, 2,014 bushels. The largest quantity handled by any one house during the same seasons was 551,771, 560,815, 557,984, and 505,100, respectively. On several occasions a single house has steamed over 170,000 bushels in one month.

The following table exhibits by months the quantity of oysters steam-canned at Baltimore during certain seasons:

Months.	1884–85.	1885–86.	1889–90.	1890–91.	1891–92.	1892–93.
	Bushels.	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*
September	61,623	67,281	.....	20,524	6,244	10,677
October	268,180	564,023	354,241	207,436	390,257	490,608
November	474,826	769,265	549,817	396,728	586,370	348,395
December	485,062	516,052	299,218	307,183	459,460	178,830
January	255,424	129,004	141,459	165,312	83,005	14,042
February	274,921	247,289	301,352	308,709	290,980	39,134
March	543,523	575,364	385,996	157,329	269,372	346,910
April	382,364	206,492	457,820	295,203	311,075	397,832
May	.....	.....	1,185	2,368	.....	.....
Total	2,745,923	3,074,770	2,491,088	1,860,792	2,396,763	1,826,428

The following is a description of the methods employed in steaming-houses:

The oysters are taken from the vessels and placed in cars of iron frame-work, 6 or 8 feet long. These cars run on a light iron track, which is laid from the wharf through the "steam chest" or

"steam box," to the shucking shed. As soon as a car is filled with oysters (in the shell) it is run into the steam chest, a rectangular oak box, 15 to 20 feet long, lined with sheet iron, and fitted with appliances for turning on steam; the doors, which work vertically and shut closely, are let down, the steam admitted, and the oysters left for ten or fifteen minutes. The chest is then opened and the car run into the shucking room, its place in the chest being immediately occupied by another car. In the shucking sheds the cars are surrounded by the shuckers, each provided with a knife and a can arranged so as to hook to the upper bar of the iron frame-work of the car. The steaming having caused the oyster shells to open more or less widely, there is no difficulty in getting out the meats, and the cars are very rapidly emptied. The oysters are then washed in ice water and transferred to the "fillers' table." The cans are filled, packed in a cylindrical iron crate or basket, and lowered into a large cylindrical kettle, called the "process kettle," or "tub," where they are again steamed; after this they are placed, crate and all, in the "cooling tub," and when sufficiently cool to be handled the cans are taken to the soldering table and there "capped"—that is, hermetically closed. From the "cappers" they are transported to another department, labeled, and packed in boxes for shipment. The whole steaming process will not occupy more than an hour from the time the oysters leave the vessel until they are ready for shipment.

The shuckers usually work in gangs of 6 or 8 persons, comprising sometimes whole families of men, women, and children. They number about 4,000, ranging in ages from 12 to 60 years, and are mostly women and children, the work being light and peculiarly adapted to them. They are mainly of foreign parentage, Germans and Austrians predominating. Few scenes are more interesting than those observed on a visit to the shucking room of any one of the large canning-houses. At one end the cars of steaming-hot oysters are received; and as these are arranged in long rows covering the length of the room the shuckers, to the number of 600 or more in some houses, dressed in their peculiar ways, surround the cars and with rapidly working knives and skill born of long experience they hastily remove the yet-steaming oysters. While the air is full of the hubbub of foreign tongues as each shucker discusses with her neighbor the petty ambitions or jealousies entertained, or relates the latest bit of domestic gossip, nothing is allowed even for a moment to stop the rapid working of their knives. Sometimes during the busy season, even before daylight, these employés may be seen surrounding the doors of the canning-houses, waiting for the day's work to commence. They are extremely industrious, and hundreds of small dwelling-houses have been purchased in Baltimore with money obtained by the women and children at work in the oyster-houses.

The shucking is done into a tin cup, known legally as the "oyster gallon cup," which holds 9 pints wine measure. The shuckers are paid at the rate of 6 cents per "cup," averaging about 65 cents per day, the total wages paid them amounting to about $80,000 annually.

About 600 other persons are employed about the canning-houses, of whom about three-fifths are men. These employés are paid from $5 to $25 per week, the total wages amounting to about $90,000 annually. The largest item of expense in the canning-houses outside of the cost of the oysters is the purchase of tin, labels, etc., this amounting to about $315,000 annually. The incidental expenses amount to about $25,000 annually. These items make the total cost of handling a bushel of oysters in the canning-houses about 29 cents, which is about 4 cents per bushel more than the expense of handling them in the raw-shucking establishments.

The cost of the oysters for the canning trade has averaged during each of the last four seasons 43, 55, 48, and 54 cents, respectively. Each bushel produces about 50 ounces of "solid meats." These are packed in 1-pound and 2-pound cans and cans of miscellaneous sizes, most of the latter being a trifle larger than the 1-pound

cans, which contain about 5 ounces of solid meats, the 2-pound cans containing 10 ounces. The price received during the last four or five years for the 1-pound and 2-pound cans has averaged about 85 cents and $1.60, respectively, per dozen. The value of the output of the canning trade during each of the last four seasons has been $1,728,985, $1,612,572, $1,856,510, and $1,505,940, an average for each bushel of oysters handled of about 69, 86, 77, and 84 cents, respectively. During the summer these houses and employés are also engaged in canning fruits and vegetables.

Through the valuable assistance of many persons connected with the oyster trade of Baltimore, I am enabled to exhibit, with much detail, the extent of the trade in that city during recent seasons, these data being presented in the following table:

Statistics of Baltimore oyster trade.

Items.	1889-90.	1890-91.	1891-92.
No. of establishments:			
Raw trade only	51	49	48
Raw and steaming trade combined	9	9	10
Steaming trade only	10	10	10
Commission sellers	14	15	15
Total	84	83	83
Property invested, value:			
Raw trade only	$734,600	$715,500	$715,000
Raw and steaming trade combined	610,000	595,000	615,000
Steaming trade only	645,000	639,000	640,000
Commission sellers	55,000	63,600	65,000
Total	2,044,600	2,013,100	2,035,000
Cash or credit capital:			
Raw trade	$650,000	$570,000	$620,000
Steaming trade	1,045,000	930,000	1,170,000
Commission sellers	240,000	255,000	260,000
Total	1,935,000	1,755,000	2,050,000
Persons engaged (proprietors and clerks):			
Raw trade only	139	130	132
Raw and steaming trade combined	42	42	44
Steaming trade only	46	46	47
Commission sellers	40	43	43
Total	267	261	266
Shuckers:			
Raw trade	3,284	3,014	3,194
Steaming trade	4,256	3,763	4,203
Total	7,540	6,777	7,397
Other employés:			
Raw trade	320	278	306
Steaming trade	560	514	554
Total	880	792	860
Grand total of persons	8,687	7,830	8,523
Trade of commission sellers:			
Oysters rec'd from transporters, bush.	5,925,400	4,393,600	5,354,320
Value received by transporters	$3,084,075	$2,967,051	$3,108,390
Value received by commission sellers	3,143,329	3,010,987	3,188,650

Items.	1889-90.	1890-91.	1891-92.
Raw-shucking trade:			
Oysters rec'd, bush	3,206,177	2,331,228	2,736,342
Expenses:			
Cost of oysters	$1,899,660	$1,806,129	$1,810,120
Wages paid to shuckers	425,909	302,164	366,430
Wages paid to others	128,247	89,752	109,365
Incidental expenses	67,330	45,760	60,000
Total	2,521,146	2,243,805	2,345,915
Products:			
Extra selects—			
Gallons	83,361	48,475	52,120
Value	$134,062	$82,184	$75,180
Selects—			
Gallons	589,724	452,266	520,610
Value	$768,260	$682,287	$724,050
Standards—			
Gallons	1,947,636	1,362,640	1,654,350
Value	$1,759,754	$1,608,055	$1,682,770
Total gallons	2,620,721	1,863,381	2,227,080
Total value	$2,662,076	$2,373,526	$2,482,000
Steaming trade:			
Oysters rec'd, bush	2,491,088	1,860,792	2,396,763
Expenses:			
Cost of oysters	$1,071,168	$1,023,436	$1,201,600
Wages paid to shuckers	74,320	61,074	73,680
Wages paid to others	98,765	74,160	97,500
Cost of tin cans, labels, etc	319,022	310,370	320,000
Incidental expenses	24,950	18,900	25,000
Total	1,588,225	1,487,940	1,717,780
Products:			
5-ounce cans, prepared—			
Number	9,569,160	7,890,632	9,388,650
Value	$723,027	$632,741	$764,450
10-ounce cans prepared—			
Number	4,579,356	3,995,521	4,643,822
Value	$632,138	$621,146	$725,515
Miscellaneous cans, *prepared*—			
Ounces	23,361,850	19,720,840	22,635,000
Value	$373,820	$358,685	$366,545
Total ounces	117,001,210	99,129,210	116,016,470
Total value	$1,728,985	$1,612,572	$1,856,510

THE COUNTY MARKETS.

The shucking-houses situated at the smaller ports along the bay shores have greatly increased both in number and capacity during the last ten years. These are usually well-built structures, and while none equal the size of the large houses in Baltimore, yet they compare well with the general run of them. They are devoted entirely to the handling of raw oysters and the business conducted by them is similar to that of Baltimore, but being nearer the reefs they are able to purchase more cheaply and frequently handle a lower grade of oysters than is utilized by the large houses in that city. All have been established since 1860, and most of them have been prominent markets only during the last fifteen years. The following notes are in reference to the most important of these markets:

Somerset County.—Amsterdam, built on herring bones, has its American counterpart in Crisfield, built on oyster shells. The center and business portion of the town is now situated where in the beginning of the oyster industry of Somerset County and even as late as 1868 vessels were accustomed to dredge for oysters or to lie in harbor. And not only does the town itself but its business and prosperity rest upon the product of the oyster reefs. This port is situated in one of the most productive oyster regions of the Chesapeake and vast quantities of these mollusks are caught within sight of the shucking-houses. Somerset has more persons engaged in catching and transporting fishery products than any other county in America, over one-half of the wage-earners thereof being engaged in the various branches of the fisheries.

The shucking trade was established at Crisfield in 1870, in competition with that of Salisbury and Seaford (Delaware), and within ten years it had grown to 700,000 bushels a year. It gradually extended beyond the limits of the town, and many shucking-houses are now situated at various points in the neighborhood convenient to the Crisfield branch of the New York, Philadelphia and Norfolk Railroad. The oysters handled are nearly all the product of Tangier and Pocomoke sounds, a quantity coming from those portions of these sounds situated within the State of Virginia. In this locality are found 28 houses, valued at $125,000, and employing 1,500 persons. The latter are mostly colored, only a few white persons being employed except in positions of responsibility. The wages paid are about the same grade as in Baltimore and approximate $175,000 annually.

Dorchester County.—Cambridge is the most extensive oyster market in this county. The importance of this port as an oyster center is of more recent development than that of Crisfield. The trade began here about 1871, but its greatest development has occurred during the last 10 years. Including the one or two small markets in other portions of the county, the trade now numbers 19 shucking-houses, valued at $50,000, and gives employment to 750 persons, disbursing about $90,000 in wages annually. Most of the oysters are obtained from the Choptank River. The annual product of the shucking-houses represents about 600,000 bushels, the cost of handling which is about 25 cents per bushel.

Talbot County.—Talbot has three wholesale oyster ports, Oxford, St. Michael, and Claiborne. Oxford is located on the Choptank River across from and competing with Cambridge. St. Michael and Claiborne are situated on the shores of Eastern Bay. The shucking trade at the latter port is of recent origin and comparatively light, but the industry at St. Michael and Oxford dates back to about 1865. Little difference exists in the trade conducted at these two ports, either in the method or quantity of oysters handled. There are at present in Talbot County 13 shucking-

houses, valued at $50,000, and employing 700 persons, who receive nearly $100,000 in wages annually. The quantity of oysters handled by these houses approximates 650,000 bushels annually and consists mostly of "Choptanks" and "Eastern Bays."

Anne Arundel County.—Excepting Baltimore, Annapolis is the only wholesale oyster market on the Western Shore of Maryland. The business was established here about 1866 and, together with the oyster fishery, at present constitutes the most important commercial source of revenue in the "Ancient City." Nearly all of the oysters handled are the product of the tonging-grounds along the shores of Anne Arundel County, with occasional cargoes from Eastern Bay and Chester River. The quantity received at this market annually amounts to about 300,000 bushels, and the persons employed in the 10 houses, which are valued at $35,000, number 400, who receive $40,000 a year in wages, the cost of handling the oysters being about $75,000.

Other ports.—Several small markets exist in Wicomico and Queen Anne counties, giving employment to about 125 persons and utilizing about 110,000 bushels of oysters annually. The shucking-houses in Wicomico County are located at Whitehaven, on the Wicomico River. Salisbury, in that county, formerly handled a large quantity of oysters and was the first wholesale market established in Maryland outside of Baltimore, but the more favorable location of Crisfield attracted the trade of Salisbury as soon as the former port obtained railroad facilities.

The oyster trade at Seaford, Delaware, located on a branch of the Nanticoke River, is entirely dependent on the product of the fishery in Maryland, nearly all of its supply being obtained from the Tangier Sound and tributaries. This was the first of the down-the-bay oyster markets, the industry being started here in 1859 by Messrs. Platt and Mallory, from Connecticut. From 1860 to 1868 a large business was done in canning raw oysters. At present there are 5 shucking-houses at Seaford, valued at $19,000, employing 415 persons, and handling about 250,000 bushels of oysters annually.

The following tables exhibit with much detail the extent of the shucking trade at the county markets during certain seasons:

The county oyster markets.

1889–90.

Counties.	Number of firms.	Number of persons engaged.	Value of property.	Cash or credit capital.	Wages paid.	Oysters received.		Oysters sold.		Enhancement in value.	Average cost per bushel.	Average value received per bushel.	Average enhancement in value per bushel.
						Bushels.	Value paid.	Gallons.	Value received.				
Somerset	27	1,436	$115,750	$112,950	$165,886	1,140,753	$513,138	771,558	$780,376	$267,238	$0.45	$0.68	$0.23
Wicomico	1	63	3,300	5,000	4,925	46,500	20,925	31,500	33,560	12,635	.45	.72	.27
Dorchester	18	789	49,430	76,500	94,440	674,200	303,390	451,254	456,558	153,168	.45	.68	.23
Talbot	14	716	47,975	37,200	102,976	709,970	333,925	484,595	505,976	172,051	.47	.71	.24
Queen Anne	2	37	1,750	1,300	5,310	35,000	14,500	23,700	23,751	9,251	.41	.67	.26
Anne Arundel	10	403	34,500	40,000	56,500	387,941	139,680	271,620	231,860	92,180	.36	.60	.24
Total	72	3,444	252,705	272,950	430,037	2,994,364	1,325,558	2,034,227	2,032,081	706,523	.44	.67	.24

1890–91.

Somerset	28	1,545	119,075	123,250	181,675	1,259,040	570,969	848,206	834,034	263,065	.46	.66	.20
Wicomico	2	123	8,800	11,500	11,633	110,500	55,250	74,950	77,680	22,430	.50	.70	.20
Dorchester	19	745	50,850	75,100	83,910	583,783	294,526	398,935	407,954	113,428	.50	.70	.20
Talbot	13	632	49,450	35,200	80,735	562,446	277,297	382,170	386,892	109,595	.49	.69	.20
Queen Anne	2	32	1,750	1,300	5,050	33,000	16,500	22,400	22,530	6,030	.50	.69	.19
Anne Arundel	9	386	33,000	39,500	34,800	261,523	136,240	201,064	187,910	51,670	.50	.70	.20
Total	73	3,463	262,925	285,850	397,803	2,810,292	1,350,782	1,927,725	1,917,000	566,218	.48	.69	.20

The following tabular statement exhibits in a comparative form the total extent of the shucking trade during a number of seasons. The increase in the county markets at the expense of the trade at Baltimore is particularly noticeable:

Table showing total extent of the oyster-shucking trade in Maryland.

Items.	1879-80.			1889-90.		
	Baltimore.	Counties.	Total.	Baltimore.	Counties.	Total.
Number of persons	6,627	2,012	8,639	8,687	3,444	12,131
Value of property	$1,360,966	$75,060	$1,436,026	$2,044,600	$252,705	$2,297,305
Cash capital	$2,338,300	$154,050	$2,497,350	$1,935,000	$272,950	$2,207,950
Wages paid	$602,427	$175,352	$777,779	$727,241	$430,037	$1,157,278
Other expenses	$497,541	$126,190	$523,731	$411,302	.....	.....
Oysters shucked:						
Raw, bushel	3,769,353	1,160,948	4,930,301	3,206,177	2,994,364	6,200,541
Value paid	$1,448,040	$300,420	$1,748,460	$1,899,660	$1,325,558	$3,225,218
Value received	$2,272,240	$453,497	$2,725,737	$2,662,076	$2,032,081	$4,694,157
Oysters canned:						
Bushels	2,689,939	33,252	2,723,191	2,491,088	.....	2,491,088
Value paid	$811,208	$7,280	$818,488	$1,071,168	.....	$1,071,168
Value received	$1,244,609	$23,403	$1,268,112	$1,728,985	.....	$1,728,985
Total oysters handled:						
Bushels	6,459,292	1,194,200	7,653,492	5,697,265	2,994,364	8,691,629
Value paid	$2,259,248	$307,600	$2,566,848	$2,970,828	$1,325,558	$4,296,386
Value received	$3,517,349	$476,499	$3,993,848	$4,391,061	$2,032,081	$6,423,142
Enhancement in value	$1,258,101	$168,899	$1,427,000	$1,420,233	$706,523	$2,126,756

Items.	1890-91.			1891-92.		
	Baltimore.	Counties.	Total.	Baltimore.	Counties.	Total.
Number of persons	7,830	3,463	11,293	8,523	3,585	12,108
Value of property	$2,013,100	$262,525	$2,275,625	$2,035,000	$270,500	$2,305,500
Cash capital	$1,755,000	$285,850	$2,040,850	$2,050,000	$295,000	$2,245,000
Wages paid	$527,150	$397,803	$924,953	$646,975	$456,350	$1,103,325
Other expenses	$375,030	.....	.....	$405,000	.....	.....
Oysters shucked:						
Raw, bushel	2,331,228	2,810,292	5,141,520	2,736,342	3,362,480	6,098,822
Value paid	$1,806,129	$1,350,782	$3,156,911	$1,810,120	$1,544,610	$3,354,730
Value received	$2,373,526	$1,917,000	$4,290,526	2,482,000	$2,368,130	$4,850,130
Oysters canned:						
Bushels	1,860,792	.....	1,860,792	2,396,763	.....	2,396,763
Value paid	$1,023,436	.....	$1,023,436	$1,201,600	.....	$1,201,600
Value received	$1,612,572	.....	$1,612,572	$1,856,510	.....	$1,856,510
Total oysters handled:						
Bushels	4,192,020	2,810,292	7,002,312	5,133,105	3,362,480	8,495,585
Value paid	$2,829,565	$1,350,782	$4,180,347	$3,011,720	$1,544,610	$4,556,330
Value received	$3,986,101	$1,917,000	$5,903,101	$4,338,000	$2,368,130	$6,706,130
Enhancement in value	$1,156,536	$566,218	$1,722,754	$1,326,280	$823,520	$2,149,800

The oyster shells.—The disposition of the shells has always been an important item for consideration in connection with the marketing of oysters. As several hundred vessels are constantly employed during seven months of each year in transporting oysters to the markets, and as 1,000 bushels of oysters produce about 1,100 bushels of shells, it can be imagined how rapidly these accumulate about the shucking-houses. The quantity of shells landed on the Maryland shores during the last ninety years approximates nearly 400,000,000 bushels, or 12,000,000 tons, twice sufficient to overload and sink every sail and steam vessel and barge and canal boat of America, and greater than the combined tonnage of all the sail vessels of the world. As three-fourths of the composition of the shell is carbonate of lime, the question that the Fool asked of King Lear—how the oyster makes its shell—appears almost unanswerable.

Until the last two or three years the shells were usually given away without cost to the recipient and even then it was so difficult to become relieved of them that those marketmen with very limited areas attached to their shucking-houses spent thousands of dollars annually in having the shells removed. But the demand for them so greatly increased that they are now a considerable source of profit. It is estimated that in

1889–90 the Baltimore marketmen in the aggregate paid $20,000 to be relieved of the shells; in 1890–91 some paid to have the shells removed, some succeeded in giving them away, while others were enabled to sell, this depending on the storing facilities of the respective market-houses, and probably the trade came out even. In 1891–92 and 1892–93 nearly all the marketmen sold their shells at prices ranging from ½ to 1½ cents per bushel, the trade receiving each season about $25,000 therefrom. A similar condition prevailed at the smaller ports of the State.

The uses to which these shells are applied are numerous and constantly increasing, the principal ones being here enumerated in the order of their extent:

1. For country-road making and filling in hollows, chiefly in Maryland, but during the last three years the Southern States bordering the coast have used large quantities for this purpose.

2. For conversion into lime for use in coal-gas making and other purposes in Maryland and adjacent States.

3. In the cultivation of oysters, mostly in Virginia, but also in Connecticut and elsewhere. In 1891–92 and 1892–93 about 750,000 bushels were each year used in this manner. The Chesapeake oyster shells are not so desirable for "cultch" as those of New York and Connecticut, because of their being thicker and flatter.

4. For the beds of railroads. While not so endurable or steady as rock, yet they answer the purpose very well. Examples of their use in this manner may be found along the Baltimore and Eastern Shore railroad, the New York, Philadelphia and Norfolk railroad between Salisbury and King Creek, the Sparrow Point road, all in Maryland, and on the Southern Pacific railroad near Morgan City, La.

5. For chicken food. This product is very well known, the shells being merely crushed into small particles. Its popularity is increasing, but the quantity of shells utilized is small.

6. In the manufacture of certain special grades of iron. The shells are used because of their being so largely composed of carbonate of lime.

STATISTICAL SUMMARY.

Early extent of the industry.—Little reliable data exist with which to exhibit the extent of the oyster industry of Maryland prior to 1865. Careful search has been made through such Maryland publications of that time as would be likely to make reference to this subject, and although this search has not been rewarded with gratifying results the following data have been obtained.

An official report of the State, made in 1840, estimated the quantity of oysters used by the trade during the previous season at 710,000 bushels, the raw-shucking trade having been established in 1836; and in 1850 one of the daily papers of the State calculated that the annual consumption by the trade was then about 1,350,000 bushels, the steaming trade having been established four years previously.

A writer in the Baltimore American in 1857 stated that the quantity of oysters marketed in the shell during the preceding season, 1856–57, was 950,000 bushels, while the shucking-houses of the State utilized 1,660,000 bushels, a total of 2,610,000 bushels. The Merchants' Magazine and Commercial Review, of New York, estimated in 1859 the Maryland crop for the season 1858–59 to have been 3,500,000 bushels.

Lieut. Paul de Broca, who visited this country in 1862 to study the oyster industry in the interests of the French Government, reported the following as the extent of the Maryland industry in 1861:*

Maryland oyster fishery in 1861.

Bushels of oysters caught	3,000,000
Value of same	$1,050,000
Number of vessels and boats employed	500
Number of persons	3,000
Capital invested	$1,800,000
Commercial value of marketed products	$3,000,000

No data exist to verify or dispute any of these statements, and it is supposed that they fairly represent the extent of the industry during the periods for which they were respectively recorded.

Beginning with 1865, the record of the number of tonging, dredging, and scraping licenses issued, as exhibited on other pages of this report, is a good index to the growth and prosperity of each branch of the fishery. The data relative to the quantity of oysters obtained since then are also more voluminous and reliable than for the preceding period.

During the first season in which the general license system was operative, 1865–66, according to Mr. C. S. Maltby, the catch by tongs amounted to 1,216,375 bushels and by dredges and scrapes 3,663,125, a total of 4,879,500 bushels.

For the seasons 1868–69, 1869–70, and 1870–71 the following statistics have been presented by Mr. Hunter Davidson, who was then in command of the fishery force:

Maryland oyster fishery in 1868–69, 1869–70, and 1870–71.

Items.	1868–69.	1869–70.	1870–71.
Vessels dredging and scraping:			
Number	563	642	637
Tonnage	12,660	14,436	14,425
Value	$449,400	$513,600	$509,600
Boats tonging:			
Number	1,907	1,647	1,792
Value	$143,025	$123,525	$134,400
Men dredging and scraping	3,560	4,060	3,775
Men tonging	3,325	3,410	3,807
Catch, dredging and scraping, bushels	6,305,600	7,190,400	6,686,400
Catch, tonging	1,735,370	2,043,075	2,261,403
Total, bushels	8,040,970	9,233,475	8,947,803
Value	$2,814,340	$3,231,716	$3,031,731

The following data were reported in 1880 by the U. S. Fish Commission, as representing the extent of the industry in 1879–80:

Maryland oyster fishery in 1879–80.

Branches of the industry.	No of boats and vessels.	Value of boats and vessels.	No of persons employed.
Dredging	700	$1,050,000	5,600
Scraping	550	440,000	2,200
Tonging	1,825	182,500	5,148
Transporting	200	300,000	800
Total	3,275	1,972,500	13,748

Oysters caught, number of bushels = 10,600,000.

*Étude sur l'Industrie Huitrière des États-Unis. Paris, 1865.

Present extent of the industry.—The following tables compiled for this report exhibit by counties the extent of the various branches of the oyster industry for the seasons 1890–91 and 1891–92:

TONGING, 1890-91.

Counties.	No. of men.	Vessels tonging.				Boats tonging.		Total vessels and boats.		Value of tongs.	Total catch.	
		No.	Tonnage.	Value.	Value of outfit.	No.	Value.	No.	Value.		Bushels.	Value.
Somerset	1,405	....	.....	.....	.....	923	$67,105	923	$67,105	$9,216	1,094,935	$522,774
Wicomico	850	....	.....	.....	.....	344	31,925	344	31,925	5,670	353,500	176,621
Dorchester	1,443	....	.....	.....	.....	1,003	60,180	1,003	60,180	7,498	409,660	205,292
Talbot	1,237	....	.....	.....	.....	656	44,090	656	44,090	7,918	402,000	201,000
Queen Anne	1,112	....	.....	.....	.....	488	30,086	488	30,086	5,065	367,375	204,374
Kent	769	....	.....	.....	.....	410	19,609	410	19,609	4,305	236,500	141,388
Anne Arundel	1,957	55	440.85	$25,760	$5,250	595	45,500	650	71,290	12,442	591,505	321,530
Calvert	1,077	9	75.92	5,315	750	512	25,016	521	30,361	10,770	264,730	146,677
St. Mary	1,380	1	12.85	750	90	756	43,125	757	43,875	10,410	463,967	267,241
Charles	192	....	.....	.....	.....	155	5,673	155	5,673	1,020	54,518	27,849
Worcester	192	3	20.62	1,150	85	112	6,480	115	7,630	795	115,143	93,070
Total	11,614	68	550.24	33,035	6,175	5,954	378,789	6,022	411.824	75,109	4,353,833	2,307,816

TONGING, 1891-92.

Counties.	No. of men.	Vessels tonging				Boats tonging.		Total vessels and boats.		Value of tongs.	Total catch.	
		No.	Tonnage.	Value.	Value of outfit.	No.	Value.	No.	Value.		Bushels.	Value.
Somerset	1,355	....	.....	.....	.....	890	$65,220	890	$65,220	$8,860	1,065,530	$486,230
Wicomico	830	....	.....	.....	.....	333	31,025	333	31,025	4,830	370,825	175,320
Dorchester	1,352	....	.....	.....	.....	933	59,480	933	59,480	7,015	450,720	212,805
Talbot	727	....	.....	.....	.....	512	36,070	512	36,070	4,835	324,650	159,180
Queen Anne	1,064	....	.....	.....	.....	564	37,590	564	37,590	5,180	420,160	209,615
Kent	862	....	.....	.....	.....	510	29,480	510	29,480	4,965	345,820	174,130
Anne Arundel	1,834	41	326.70	$19,865	$4,300	574	44,210	615	64,075	11,625	667,295	328,975
Calvert	1,102	8	70.18	5,200	710	523	28,350	531	33,550	11,010	334,640	173,915
St. Mary	1,394	....	.....	.....	.....	759	43,990	759	43,990	11,015	487,675	274,210
Charles	167	....	.....	.....	.....	122	5,105	122	5,105	940	44,500	21,840
Worcester	126	....	.....	.....	.....	89	5,370	89	5,370	525	94,520	80,640
Total	10,813	49	396.88	25,065	5,010	5,809	385,890	5,858	410,955	70,800	4,606,385	2,296,860

The extent of the bedding or planting industry is here included. This is so small, amounting to about one-seventieth of the extent of the tonging fishery, that this arrangement does not preclude the use of the foregoing figures as an exposition of the extent of the common fishery as prosecuted by means of tongs.

DREDGING, 1890-91.

Counties.	No. of men.	Vessels dredging.				Boats dredging.		Total vessels and boats.		Value of apparatus.	Total catch.	
		No.	Tonnage.	Value.	Value of outfit.	No.	Value.	No.	Value.		Bushels.	Value.
Somerset	2,453	412	7,338.63	$329,420	$124,060	13	$2,610	425	$332,030	$37,745	1,823,030	$913,080
Wicomico	88	13	305.41	14,225	4,815	....	.....	13	14,225	1,742	42,190	22,085
Dorchester	203	31	649.10	30,215	10,640	....	.....	31	30,215	3,620	84,500	43,300
Talbot	78	18	170.37	8,420	4,220	....	.....	18	8,420	1,820	46,160	24,235
Kent	11	2	31.45	1,075	352	....	.....	2	1,075	125	2,800	2,150
Baltimore	2,015	235	7,591.44	228,645	84,694	....	.....	235	228,645	21,150	767,046	554,231
Anne Arundel	40	11	121.16	9,615	1,505	....	.....	11	9,615	550	23,900	16,300
Calvert	119	19	410.70	22,805	3,035	4	680	23	23,485	1,445	56,550	36,300
St. Mary	208	18	215.90	12,475	2,400	45	3,820	63	16,295	2,350	63,106	34,224
Total	5,215	759	16,834.16	656,895	235,721	62	7,110	821	664,005	70,547	2,909,282	1,645,905

Of the foregoing, 183 vessels (2,648.23 tons) and 13 boats from Somerset, 16 vessels (156.31 tons) from Dorchester, and 9 vessels (81.24 tons) from Talbot, engaged in scraping within the limits of those counties, catching 465,000, 20,000 and 8,000 bushels respectively, reducing the catch in "State waters" to 2,416,282 bushels, with a value of $1,405,905.

DREDGING, 1891-92.

Counties.	No. of men.	Vessels dredging.				Boats dredging.		Total vessels and boats.		Value of apparatus.	Total catch.	
		No.	Tonnage.	Value.	Value of outfit.	No.	Value.	No.	Value.		Bushels.	Value.
Somerset	2,225	351	6,739.37	$306,145	$116,750	11	$2,890	362	$309,035	$32,575	1,993,220	$864,195
Wicomico	28	5	94.05	4,975	2,200	....	.....	5	4,975	585	19,350	9,680
Dorchester	283	42	799.44	37,620	14,680	....	.....	42	37,620	4,060	165,085	70,120
Talbot	54	12	121.53	6,100	2,650	....	.....	12	6,100	965	44,130	18,885
Kent	14	2	52.04	2,100	380	....	.....	2	2,100	210	8,235	4,300
Baltimore	1,964	221	6,992.34	221,670	84,875	....	.....	221	221,670	20,480	1,123,715	621,460
Anne Arundel	114	25	333.42	24,210	5,400	1	450	26	24,660	1,710	86,280	38,350
Calvert	167	20	228.22	15,850	3,100	20	3,425	40	19,275	2,255	109,850	56,100
St. Mary	204	19	257.56	13,440	3,500	39	2,630	58	16,070	2,480	102,500	54,120
Charles	6	2	42.42	2,600	300	....	.....	2	2,600	160	5,600	3,100
Total	5,059	699	15,660.39	634,710	233,835	71	9,395	770	644,105	65,430	3,657,965	1,740,310

Of the foregoing, 178 vessels (2,385.60 tons) and 11 boats from Somerset, 16 vessels (153.70 tons) from Dorchester, and 4 vessels (36.20 tons) from Talbot County engaged in scraping within the limits of those counties, catching 500,000, 20,000, and 4,000 bushels, respectively, reducing the catch by dredging in "State waters" to 3,133,965 bushels, with a value at first hands of $1,502,310.

SCRAPING, 1890-91.

Counties.	No. of men.	Vessels.				Boats.		Total vessels and boats.		Value of apparatus.	Catch.	
		No.	Tonnage.	Value.	Value of outfit.	No.	Value.	No.	Value.		Bushels.	Value.
Somerset	1,416	105	931.30	$47,185	$26,225	331	$78,210	436	$125,395	$20,509	1,319,317	$663,498
Dorchester	1,806	268	459.59	129,935	53,447	266	34,580	534	155,515	23,051	1,157,786	577,390
Talbot	383	23	2,196.79	10,455	4,090	79	18,160	102	28,615	3,410	204,840	101,257
Total	3,605	396	3,587.68	187,575	83,762	676	130,950	1,072	309,525	46,970	2,681,943	1,342,145

In addition to the foregoing, 183 dredging vessels (2,648.23 tons) and 13 boats from Somerset, 16 dredging vessels (156.31 tons) from Dorchester, and 9 dredging vessels (81.24 tons) from Talbot engaged in scraping within the limits of those counties, catching therein 465,000, 20,000, and 8,000 bushels, respectively, thus increasing the catch on scraping areas to 3,174,943 bushels, with a value to the oystermen of $1,582,145.

SCRAPING, 1891-92.

Counties.	No. of men.	Vessels.				Boats.		Total vessels and boats.		Value of apparatus.	Catch.	
		No.	Tonnage.	Value.	Value of outfit.	No.	Value.	No.	Value.		Bushels.	Value.
Somerset	1,514	116	1,036.42	$53,015	$27,960	338	$79,685	454	$132,700	$21,620	1,472,630	$651,280
Dorchester	1,952	280	2,602.38	131,420	56,975	280	37,590	566	169,010	25,050	1,715,450	701,060
Talbot	291	18	145.82	8,875	3,640	56	14,520	74	23,395	2,735	180,300	76,610
Total	3,757	420	3,784.62	193,310	88,575	674	131,795	1,094	325,105	49,405	3,368,380	1,428,950

In addition to the foregoing, 178 vessels (2,385.60 tons) and 11 dredging boats from Somerset, 16 dredging vessels (153.70 tons) from Dorchester, and 4 dredging vessels (36.20 tons) from Talbot engaged in scraping within the limits of those counties, catching 500,000, 20,000, and 4,000 bushels, respectively, thus increasing the catch on scraping areas to 3,892,380 bushels, with a value of $1,666,950.

It should be observed that those vessels and boats engaged both in dred ging and scraping are reported only under the former caption, in order to avoid a duplication of the property and men employed in the fishery. Many estimates heretofore made on the extent of this industry failing to note this duplication have thereby reported 225 vessels and boats, 1,000 men, and a catch sometimes amounting to over 1,000,000 bushels more than was actually the case.

TRANSPORTING.

Counties.	1890-91.					1891-92.				
	Vessels.				No. of men.	Vessels.				No. of men.
	No.	Tonnage.	Value.	Value of outfit.		No.	Tonnage.	Value.	Value of outfit.	
Somerset	60	2,005.24	$91,150	$13,822	266	78	2,399.48	$120,360	$17,100	331
Wicomico	10	383.65	19,500	2,495	46	15	564.17	30,260	3,600	63
Dorchester	45	1,981.84	98,100	10,735	198	41	1,956.16	92,850	9,650	179
Talbot	3	100.94	5,200	590	11	5	138.50	7,350	980	20
Queen Anne	18	344.95	15,150	2,336	48	19	367.84	17,200	2,800	59
Kent	40	637.02	20,350	3,873	87	39	620.05	20,100	3,950	85
Baltimore	152	5,741.73	219,675	16,899	552	194	7,266.83	269,375	25,820	693
Anne Arundel	28	492.32	27,050	2,233	78	22	352.84	22,625	1,840	62
Calvert	22	894.07	49,175	3,465	84	21	865.13	47,875	3,400	81
St. Mary	21	529.69	23,650	2,742	74	22	536.29	25,240	3,150	78
Total	399	13,111.45	569,000	59,190	1,444	456	15,067.29	653,235	72,290	1,651

Condensed tables exhibiting the extent of the various branches of the fishery.

1890-91.

Items.	Persons engaged.	Vessels and boats.		Value of apparatus.	Value of outfit.	Total capital invested.	Products.	
		No.	Value.				Bushels.	Value.
Tonging	11,614	6,022	$411,824	$75,109	$6,175	$493,108	4,353,833	$2,307,816
Dredging	5,215	821	664,005	70,547	235,721	970,273	2,909,282	1,645,905
Scraping	3,605	1,072	309,525	46,970	83,762	440,257	2,681,943	1,342,145
Transporting	1,444	399	569,000	.....	59,190	628,190	.....	*370,000
Total	21,878	8,314	1,954,354	192,626	384,848	2,531,828	9,945,058	5,665,866

1891-92.

Tonging	10,813	5,858	410,955	70,800	5,010	486,765	4,606,385	2,296,860
Dredging	5,059	770	644,105	65,430	233,835	943,370	3,657,965	1,740,310
Scraping	3,757	1,094	325,105	49,405	88,575	463,085	3,368,380	1,428,950
Transporting	1,651	456	653,235	.....	72,290	725,525	.....	*400,000
Total	21,280	8,178	2,033,400	185,635	399,710	2,618,745	11,632,730	5,866,120

* Enhancement in value of oysters transported.

NOTE.—Sufficient data are not at hand to exhibit similar tables for 1892-93, but the information from the various oystering centers indicates that the yield during that season was about 10,142,500 bushels, for which the oystermen and transporters received $5,500,000. Of this amount 4,432,500 bushels were obtained by tongmen, 3,100,000 by dredgers, and 2,610,000 by scrapemen, the total number of men employed approximating 21,200.

GRAND SUMMARY.

1890-91.	Persons engaged.	Amount of capital employed.	1891-92.	Persons engaged.	Amount of capital employed.
Oystering and transporting	21,878	$2,531,828	Oystering and transporting	21,280	$2,618,745
Marketing	11,293	4,316,475	Marketing	12,108	4,650,500
Total	33,171	6,848,303	Total	33,388	7,269,245

The total extent to which Maryland is dependent on the oyster fishery is not fully indicated in the foregoing tables. The amount of money received by the oystermen for their product poorly represents the value of this industry. In the eleven counties in which the fishery is prosecuted it is the mainstay of the people, and the prosperity of nearly all business therein is regulated by it. As four-fifths of the oysters are sent out of the State through wholesale markets, etc., and as the value of the product after it has passed through these markets and transportation agencies averages about 90 cents for each bushel originally represented, it is reasonable to assume that for each bushel of oysters caught in Maryland about 70 cents is brought into the State. During the last ten years this would amount to about $80,000,000 received by the oystermen, marketmen, transportation agencies, etc., which would not have been brought into the State were it not for the oyster fishery, and this does not include the value of the millions of bushels of oysters consumed within the State. This sum is much greater than the total taxable value of all property located in the counties in which this fishery is prosecuted, not including the city of Baltimore.

At least 95 per cent of this revenue is received by men whose wages or incomes amount to less than $1,000 a year. In this class are included all the oystermen and nearly all the employés of the shucking-houses and transportation agencies. Then, when consideration is taken of the large number of persons engaged in other vocations, but dependent on the patronage of these men to a greater or less extent, such as vessel builders and repairers, sail-makers, blacksmiths, house carpenters, grocerymen, merchants, even the physicians, lawyers, etc., the enormous value of the industry is apparent, and it is observed how vitally important to the people of the State is the continued prosperity of the fishery.

A careful survey of the extent of the oyster product of Maryland from the beginning of the present century develops the following as an approximation of the product during each decade, not including those taken by non-residents or those used for fertilizing purposes:

Period.	No. of bushels.	Period.	No. of bushels.
1800–1810	2,500,000	1860–1870	63,000,000
1810–1820	4,000,000	1870–1880	114,000,000
1820–1830	5,000,000	1880–1890	116,000,000
1830–1840	8,000,000	1890–1893	31,720,000
1840–1850	15,000,000		
1850–1860	34,000,000	Total	393,220,000

To exhibit the comparative value of this product, the following tabular statement is submitted showing the average prices received at Baltimore during the seasons indicated for "straight up" or standard stock. These figures are a trifle higher than the average for the product of the State:

Season.	Average price per bushel.	Season.	Average price per bushel.
	Cents.		*Cents.*
1850–51	30	1880–81	40
1855–56	30	1885–86	45
1860–61	35	1889–90	53
1865–66	*70	1890–91	69
1870–71	35	1891–92	62
1875–76	33	1892–93	66

*War prices.

STATE REVENUE AND FISHERY FORCE.

The State as a landlord.—Let us now view the oyster industry from another standpoint, and, remembering that the extensive areas of reefs are the properties not of the oystermen but of the State at large, examine Maryland's record as a financier in controlling these properties, omitting consideration for the time being of her position as legislator and patron of the industries within her limits.

Comparatively few of the United States have considered it expedient to burden any branch of the fisheries with a special tax; on the contrary the fishermen have at times been the recipients of assistance in the form of relief from certain general taxes or in the granting of bounties. But there is a growing tendency to consider the taking of oysters different from the ordinary fisheries and to cause it to bear some special part in paying the expenses of the State aside from the ordinary taxation of the property engaged in the business.

Maryland was among the first of the States to impose a tax upon the catching of oysters, this being in 1854, when the local scraping license for Somerset County was authorized, followed in 1865 by the adoption of the general license system. Since 1854 and up to the close of the fiscal year 1893 the revenue received from the issuing of oystering licenses by this State has amounted to $1,781,520.61, not including the revenue from fines imposed for violating the oyster laws, as this can not be considered a tax on the fishery. This is a greater amount than all the remaining States of America have received by special taxation from all branches of their free and private fisheries combined. All of this money has not been paid directly into the treasury of the State, a portion of it being devoted to the purposes of the counties in the waters of which the licenses authorized oystering; nevertheless it is public revenue, collected by authority of the general assembly and subject to disposition thereby.

The following table exhibits by fiscal years (October 1–September 30) the license fees received from each branch of the fishery, the rate of fees required during each season having been exhibited on the preceding pages:

Table exhibiting the license revenue during each fiscal year from the various branches of the oyster fishery.

Years.	Tonging.	Dredging.	Scraping.	Total.	Years.	Tonging.	Dredging.	Scraping.	Total.
1854–64....	.....	.....			1879–80....	$7,025.00	$18,606.50	$2,689.40	$28,320.90
1864–65....	$1,919.10	$12,111.20			1880–81....	8,182.35	40,589.98	3,986.14	52,758.47
1865–66....	8,098.75	48,463.22	$51.380.00	$252,582.52	1881–82....	8,422.00	52,582.05	4,108.85	65,112.90
1866–67....	6,183.44	22,515.29			1882–83....	8,752.00	48,841.64	5,241.00	62,834.64
1867–68....	11,669.20	32,535.90			1883–84....	9,161.00	45,127.65	5,730.62	60,019.27
1868–69....	10,905.56	46,800.86			1884–85....	15,627.00	69,528.72	6,489.94	91,645.66
1869–70....	9,409.80	38,675.80	2,830.00	50,915.60	1885–86....	13,083.00	49,631.59	9,752.08	72,466.67
1870–71....	7,900.00	41,587.46	5,172.00	54,659.46	1886–87....	12,626.00	52,411.68	9,620.64	74,658.42
1871–72....	8,790.45	39,039.62	5,776.00	53,606.07	1887–88....	13,082.00	48,675.54	8,321.34	70,078.88
1872–73....	8,969.00	54,159.46	4,954.00	68,082.46	1888–89....	13,812.00	57,928.72	8,374.29	80,115.01
1873–74....	7,420.50	30,227.77	4,206.00	41,854.27	1889–90....	15,741.00	52,945.27	10,440.43	79,127.70
1874–75....	7,454.00	42,355.58	4,923.42	54,733.00	1890–91....	24,943.00	50,275.03	15,176.95	90,394.98
1875–76....	6,797.00	48,468.68	4,418.04	59,683.72	1891–92....	22,888.00	44,744.73	13,667.93	81,290.66
1876–77....	6,382.00	49,837.46	3,625.65	59,845.11	1892–93....	32,353.50	44,781.72	13,333.74	90,468.96
1877–78....	5,504.00	37,408.39	2,623.20	45,535.59					
1878–79....	6,075.00	31,173.29	3,472.50	40,720.79	Total ...	319,175.65	1,252,030.80	210,314.16	1,781,520.61

From the foregoing table it is observed that during the last five years the revenue from tonging, dredging, and scraping has been $109,737.50, $250,675.47, and $60,993.34, respectively, or an annual average of $21,947.50, $50,135.09, and $12,198.67. The area

of the natural reefs on which these three forms of fishery are prosecuted has been found to be about 154, 121, and 80 square miles, respectively, and the average annual product during the last five years, 4,850,000, 3,450,000, and 2,750,000 bushels. These data form the basis of the following tabular statement:

Form of fishery.	Area, square miles.	Product, bushels.	Annual revenue, average for five years.	Average revenue.	
				Per square mile.	Per 1,000 bushels.
Tonging	154	4,850,000	$21,947.50	$142.51	$4.52
Dredging	*121	3,450,000	50,135.09	414.33	14.53
Scraping	80	2,750,000	12,198.67	152.48	4.43
Total	355	11,050,000	84,281.26		
Average				237.41	7.62

* Of this area 42 square miles are used also by Virginia oystermen.

The foregoing table exhibits the annual average rate of revenue for the last five years, but as the license fees for tonging were increased in 1892 it does not properly exhibit the extent of the tax which that branch of the fishery is now paying, and the following table is submitted for this purpose, showing the condition of the license-revenue receipts for the season 1892–93:

License-revenue receipts for 1892–93.

Form of fishery.	Area, square miles.	Product, bushels.	Annual revenue.	Average revenue.	
				Per square mile.	Per 1,000 bushels.
Tonging	154	4,432,500	$32,353.50	$210.09	$7.30
Dredging	121	3,100,000	44,781.72	370.14	14.44
Scraping	80	2,610,000	13,333.74	166.67	5.10
Total	355	10,142,500	90,468.96		
Average				254.84	8.92

The fact that about 200 vessels and boats work under both a dredging and a scraping license complicates somewhat the consideration of the proportionate revenue per square mile or per 1,000 bushels for those two forms of fishing. In the two foregoing tables the catch made by these craft has been noted entirely under dredging. Were it practicable to exhibit with greater accuracy these average items for the two branches of fishery indicated the average revenue from dredging per square mile would be slightly decreased and the revenue per 1,000 bushels would be slightly increased and an opposite effect would be produced in these two items for the scraping branch of the fishery, but the change effected would not be material.

It is thus observed that during the last season the dredgers have paid twice as much revenue or tax per 1,000 bushels as the tongmen and nearly three times as much as the scrapemen. The total revenue during that season averaged $8.92 per 1,000 bushels, or $254.84 per square mile, or 40 cents per acre. As the oystermen received about $5,500,000 for their catch, the State revenue was at the rate of over $16 per $1,000 worth of oysters.

The total revenue since the adoption of the license system being $1,781,520.61, and the area of the reefs approximating 355 square miles, the State has up to the

present time received from the reefs, in the form of license fees, an average of $5,018.36 per square mile or $7.84 per acre.

As we can judge of the ability of one financier only by comparing his operations with those of others, let us examine what has been done by other States so far as deriving a revenue from the public oyster reefs is concerned. The following oyster-producing States derive no revenue from this source: Massachusetts, Rhode Island, New York, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Texas, California, Oregon, Washington.

Prior to 1893 Connecticut did not tax her oystermen for working on the public reefs, but in that year adopted a license system on the following basis: For each boat or vessel working on the public reefs the owner thereof is required to pay annually the sum of $2 if the boat or vessel measures less than 5 tons, but if it measures over 5 tons he is required to pay 50 cents for each additional ton.

In New Jersey the only public-reef oystermen subjected to special taxation are those who gather oysters from the waters of Cumberland County in Delaware Bay. These men are required to obtain a license at the rate of $5 on all craft not over 5 tons, and $1 per ton, custom house measurement, on all boats and vessels exceeding that tonnage. The total revenue amounts to about $5,000 annually, while the catch is about 1,300,000 bushels valued at $400,000, the area of the natural beds being about 60,000 acres. But this revenue is not so much a tax on the public-reef oystermen as upon the planting operations of that region, for the license also permits without further cost the preëmption of sufficient area of ground in Delaware Bay for planting the oysters obtained from the public reefs, this area being about 10,000 acres.

Within the limits of Pennsylvania there are no oyster beds whatever, either public or private. The oysters usually credited to that State are gathered from the beds situated within New Jersey and Delaware and are obtained in accordance with the regulations of those States.

In Delaware each tongman, with a few minor exceptions, is required to obtain an annual license, costing $5. The number of men licensed during each of the last six seasons has been as follows: 1887, 61; 1888, 67; 1889, 68; 1890, 80; 1891, 48; 1892 (September 1, 1892, to March 31, 1893), 68. The catch amounts to about 120,000 bushels annually, valued at $32,000. The dredging regulations in Delaware are quite similar to those operative in Cumberland County, N. J., the license authorizing the preëmption of ground for planting purposes in addition to permitting the gathering of oysters from the public reefs. The fee is $3 per ton, and the revenue amounts to about $600 annually. The area of reefs on which the dredgers operate is about 4,500 acres, and the annual catch is about 85,000 bushels, valued at $20,000.

In Virginia dredging vessels are required to pay a license fee of 50 cents per ton for each month in which they are engaged, and each tongman is required to pay annually the sum of $2 and an additional fee of 50 cents for each boat used. The constitution of the State interdicts the taxing of tongs used on oyster reefs; but conflict with this is avoided by providing, under an elaborate system, for a tax on the quantity of oysters caught and permitting the tongmen to pay an annual fee of $2 in lieu thereof. From 1880 to 1891, inclusive, the Virginia receipts from all forms of oyster-license tax in the State amounted to $120,153.83 and the disbursements for the oyster police force, etc., were $163,197.43.

The present license system became operative in 1884, and the annual receipts and disbursements since then have been as shown in the following tabular statement:

Virginia oyster fund.

Fiscal year.	Receipts.	Disbursements.
1884	$919.93	$18,907.97
1885	26,476.93	27,025.66
1886	22,949.89	22,574.25
1887	13,329.21	16,712.35
1888	13,755.89	18,922.82
1889	12,455.56	17,190.94
1890	12,817.53	19,561.73
1891	14,114.83	21,683.92
Total	116,819.77	162,579.64

These figures include a small revenue from taxing the private planting-grounds; this, however, is so small that for the purposes of the present discussion they may be considered as representing only the revenue from the public reefs.

In Louisiana, the remaining State which provides for taxing public-reef oystermen, tonging is the only form of oystering permitted, and the license system regulating it is based on that of Virginia, even to the adoption of the complicated system which the latter State provided in order to avoid conflict with its constitution. The fee in Louisiana is at the rate of 50 cents annually for each boat employed, and an additional 50 cents every three months for each man engaged. Difficulty, however, has been experienced in collecting the revenue and the regulation is practically inoperative.

An approximation, for the last year for which data are at hand, of the product of the natural or public oyster reefs of each of the United States and the license receipts therefrom is contained in the following table:

Product of public oyster reefs and State revenue therefrom.

State.	Public oyster reefs.		Revenue.	Year.
	Bushels.	*Value.*		
Massachusetts	25,000	$15,000	.....	1892
Rhode Island	16,865	7,858	.....	1892
Connecticut	211,090	68,589	.....	1892
New York	810,629	485,730	.....	1891
New Jersey	1,300,000	400,000	$5,200	1892
Delaware	205,272	51,872	940	1892
Virginia	5,690,700	2,290,850	14,115	1891
North Carolina	807,260	175,567	.....	1890
South Carolina	63,150	23,204	.....	1890
Georgia	224,357	40,520	.....	1890
Florida	468,431	108,542	.....	1890
Alabama	481,070	107,812	.....	1890
Mississippi	806,478	166,672	.....	1890
Louisiana	820,000	260,000	.....	1890
Texas	440,800	127,990	.....	1890
Washington	142,730	127,000	.....	1892
Oregon	2,500	3,125	.....	1892
Total	12,516,332	4,460,331	20,255	.....
Maryland	10,142,500	5,500,000	90,469	1893

Of the Maryland revenue, all of the dredging fees have been paid into the State treasury and the greater portion of the tonging and scraping fees into the treasuries

of the counties wherein the licenses were respectively issued. Prior to 1874–75 all of the tonging fees, amounting to $81,266.25, were paid into the State treasury, and the receipts from this branch of the fishery in 1892–93, under the new license system, amounted to $2,672.70, making a total of $83,938.95 that has been paid into the treasury of the State out of the $319,175.65 revenue from tonging licenses.

Of the revenue from scraping licenses, nothing was paid into the State treasury prior to 1892–93 except the revenue in Dorchester County in 1870–71 and 1871–72, which amounted to $3,008. In 1892 it was required that 10 per cent of the revenue from scraping licenses, after deducting 5 per cent for collection, should be paid into the State treasury. The revenue from the latter source in 1892–93 was $1,266.63, making a total of $4,274.63 received into the State treasury out of a total of $210,314.16 received in fees from this branch of the fishery. These figures form the basis of the following table:

Total revenue received from oyster licenses in Maryland.

Depository.	Tonging.	Dredging.	Scraping.	Total.
State treasury	$83,938.95	$1,252,030.80	$4,274.63	$1,340,244.38
County treasuries	235,236.70		206,039.53	441,276.23
Total	319,175.65	1,252,030.80	210,314.16	1,781,520.61

In addition to the foregoing items the State treasury has received since 1884 one-tenth of a cent for every bushel of oysters used at the steaming-houses, this amounting to $22,461.20 to the present date; also since 1865 from oyster measurers, fines, and other sources, $89,807.25; and the counties have collected about $55,000 from the imposing of oyster fines, etc. This makes a grand total of $1,948,789.04 collected from all branches of the oyster industry since the establishment of the license system. Of this revenue, $1,452,512.83 has been paid into the State treasury to the credit of the "oyster fund," and "packers' fund," and $496,276.23 has been received into the treasuries of the tide-water counties.

The revenue paid into the county treasuries has been devoted mostly to public-school purposes, a very small portion being used for enforcing the oyster regulations in certain counties, and in Worcester and Somerset counties in the planting of oyster shells for the extension and improvement of the oyster reefs. In 1892–93 the clerks of the circuit courts received $5,264.18 for issuing the tonging and scraping licenses, but prior to that season they received nothing.

The "oyster fund" of the State treasury has been used chiefly in equipping and maintaining the fishery force, about $1,200,000 having been devoted to that purpose up to the close of the fiscal year 1893. Numerous other items have assisted in diminishing this fund, among which may be mentioned the refunding of transportation license fees collected in 1884 and 1885, amounting to $27,644.15; the expenditure of $4,892.35 in an experiment in planting oyster shells; the expenses of various State commissions or legislative committees appointed to investigate certain features of the industry; painting numbers for the dredging vessels; court procedures, etc.

The following table exhibits by fiscal years the receipts and disbursements of the State "oyster fund" since the origin of the general license system:

Receipts and disbursements of the State oyster fund, since the origin of the general license system.

Fiscal year ending Sept. 30.	Receipts from dredging.	Total receipts.	Disbursements.	Balances.	Fiscal year ending Sept. 30.	Receipts from dredging.	Total receipts.	Disbursements.	Balances.
1865....	$12,111.20	$14,030.20	.....	$14,030.20	1881....	$40,589.98	$44,925.71	$38,403.62	$219,304.75
1866....	48,463.22	56,561.97	.....	70,592.17	1882....	52,582.05	57,751.05	39,070.59	237,985.21
1867....	22,515.29	28,778.65	$80.85	99,289.97	1883....	48,841.64	56,075.32	54,114.13	239,946.40
1868....	32,535.90	45,326.87	21,321.91	123,294.93	1884....	45,127.65	67,650.78	62,704.83	244,892.35
1869....	46,800.86	61,301.49	28,186.80	156,409.62	1885....	69,528.72	79,704.17	127,089.56	197,506.96
1870....	38,675.80	50,098.74	32,381.79	174,126.57	1886....	49,631.59	51,057.74	106,600.62	141,964.08
1871....	41,587.46	53,136.96	23,675.29	203,588.24	1887....	52,411.68	55,561.73	67,221.88	130,303.93
1872....	39,039.62	50,782.27	23,076.17	231,294.34	1888....	48,675.54	53,236.69	67,913.13	115,627.49
1873....	54,159.46	65,490.55	24,770.75	272,014.14	1889....	57,928.72	61,362.08	63,306.09	113,883.48
1874....	30,227.77	36,278.65	36,882.97	271,409.82	1890....	52,945.27	58,178.67	70,955.91	101,106.24
1875....	42,355.58	43,560.53	67,484.87	247,485.48	1891....	50,275.03	52,260.33	73,645.81	79,720.76
1876....	48,468.68	50,764.78	48,368.00	249,882.26	1892....	44,744.73	46,652.83	79,665.11	46,708.48
1877 ...	49,837.46	51,078.76	50,136.76	250,824.26	1893....	44,781.72	48,437.12	91,302.03	3,847.57
1878....	37,408.39	38,426.83	41,683.86	247,567.23					
1879....	31,173.29	31,969.12	44,379.76	235,156.59	Total .	1,252,030.80	1,430,051.63	1,426,204.06	.....
1880....	18,606.50	19,411.04	41,784.97	212,782.66					

The State fishery force.—Prior to 1865 the enforcement of the oyster regulations was left to the care of the sheriffs and constables with the assistance of the posse comitatus and such vessels or steamers as they might desire to impress into their temporary service, the same being at the risk and expense of the State. When the license system was adopted in 1865 all captains and employés of licensed vessels and boats were constituted officers of the State, with full powers of sheriffs in the enforcement of the oyster laws. In 1867 (ch. 184) the comptroller of the treasury was authorized, at such times as he might think the interests of the State required, to charter a steamer properly manned and equipped to cruise in the bay for special periods of time not exceeding ten days, to overhaul and examine the vessels engaged in oystering, and to arrest offenders. All of these methods proved so ineffectual that in 1868 (ch. 406) provision was made for an "oyster police force," now officially designated the "State fishery force," but popularly known as the oyster navy; and an appropriation was made for the purchase of one steamer and two sail vessels to be kept constantly cruising in the waters of the State where violations of the oyster regulations might be expected. The control of this force was vested in the "board of public works," consisting of the governor and certain other officials of the State. This board was authorized to properly equip and provision the vessels and supply them with competent officers and men.

The fleet obtained consisted of one steamer of 113 tons burden and two fast-sailing vessels well equipped with boats and with 5 men each. Both steamer and sail vessels were supplied with cannon and ammunition, which they were authorized to use in enforcing the oyster regulations. One of the sailing vessels patrolled the Chesapeake and tributaries above the Patuxent and the other one below that point, while the steamer was kept cruising over the entire bay and tributaries. In 1874 six additional vessels were added to the force, at a cost of $20,000; in 1882, 1883, and 1884 additional vessels were added, and in 1885 two steamers were obtained at a cost of $62,000. In 1888 the old steamer was disposed of and additional sail vessels added.

At present the force consists of 2 steamers, 9 schooners, 2 sloops, and 8 smaller and "local" boats. The latter are employed for six months only and are provided by certain counties to enforce the oyster regulations within their respective limits, yet are under the direction of the commander of the State force. They carry 3 or 4 men each and are armed with rifles. Of the State vessels, the steamers each have a crew numbering 12 men, and the schooners and sloops have 6 men each, all vessels being furnished with one cannon and a number of rifles. This makes a total of 120 men in the force, and the cost of maintaining the fleet, including all salaries, provisions, ammunition, repairs, etc., has during the last five years averaged about $65,000 annually.

One of the sail vessels patrols the Chester River including Swan Point; one the Eastern Bay and tributaries and the waters of Talbot County as far down as Black Walnut Point; one the Choptank River and tributaries, one the Little Choptank River; one the waters of Fishing Bay, Honga River, Tar Bay, Hooper Straits, and Holland Straits; one the waters of Wicomico County, one the waters of Somerset County; two the waters of Anne Arundel, and two the waters of Calvert, St. Mary and Charles counties, while the steamers cruise throughout the State except in the Sinepuxent Bay.

The principal duties of the force are to see that no one engages in oystering without obtaining a license, to prevent the dredgers from oystering on the reefs used by the scrapemen, and to prevent both dredgers and scrapemen from resorting to the areas reserved for the tongmen, to enforce the close season, the cull law, and the various minor regulations of the oyster industry, as well as the fish and water-fowl laws of the State. While during certain years this fleet has not succeeded in accomplishing as much as some persons expected of it, yet considering the extensive area of water to be guarded and the thousands of oyster boats and vessels at work, it is not surprising that violations of the regulations occur.

The most noticeable violations of the regulations are made by the dredgers in frequenting areas reserved for the tongmen. These became especially prominent in the fall of 1888. The police vessels were not so well armed then as at present and the oystermen lost confidence in the ability of the force, in the fights occurring, the former being frequently routed by the dredgers. On several occasions during that year a number of dredging vessels combined and openly defied the fishery force. This aroused popular attention; the fleet was better provided with arms and ammunition, its personnel reorganized, several dredging vessels were sunk, and a few men killed. Since then the oystermen have had greater respect for the law, and while at times a dredger may trespass on forbidden areas it is usually done under cover of darkness or fog, and such violations are not by any means so frequent as formerly.

Prior to 1880 the members of the crew as well as the captain of the vessel were held liable for violations of the oyster laws, and the vessel was allowed to go free. When caught, the captain and crew were placed in jail, but the former was usually bailed out and his fine paid if the case ultimately went against him. The crew being penniless and without friends frequently remained in jail for months, imposing an expense on the county. Many of these men were foreigners and very few of them were familiar with the laws regulating the fishery, and it was manifestly unjust to make them suffer for obeying the orders of their captains. This has since been remedied, and the penalty for violating the oyster laws is now properly shared by the vessel.

CONCLUSION.

The common fishery.—From the data presented on the preceding pages is obtained the following tabular statement, exhibiting for a period of years the total number of persons employed in the oyster fishery of Maryland and the total quantity and value of the products:

Season.	No. of men.	Bushels of oysters.	Value.	Season.	No. of men.	Bushels of oysters.	Value.
1860-61	3,000	3,000,000	$1,050,000	1889-90	20,481	10,450,087	$5,204,456
1868-69	6,885	8,040,970	2,814,340	1890-91	21,878	9,945,058	5,665,866
1869-70	7,470	9,233,475	3,231,716	1891-92	21,280	11,632,730	5,866,120
1870-71	7,582	8,947,803	3,031,731	1892-93	21,200	10,142,500	5,500,000
1879-80	13,748	10,600,000	3,869,000				

It is surprising and contrary to what might be expected from observations in other States and countries that the oyster reefs of Maryland have continued so long to produce oysters in such abundance, notwithstanding the vigorous fishery to which they have been subjected. But it will be observed that while little variation has existed during the last twenty-five years in the quantity of oysters obtained annually, there has been a very large increase in the number of persons, vessels, and boats employed, indicating a decrease in the average catch per man and necessitating an increase in the price of the oysters.

The following table exhibits for a number of seasons the average catch of oysters and the average gross income for each man engaged in the fishery:

Season.	Average per man.		Season.	Average per man.	
	Bushels of oysters.	Gross income.		Bushels of oysters.	Gross income.
1860-61*	1,000	$350	1889-90	510	$254
1868-69	1,168	409	1890-91	455	259
1869-70	1,236	432	1891-92	547	275
1870-71	1,180	399	1892-95	478	259
1879-80	771	281			

* No dredging.

It is thus observed that according to the data at hand the present average catch per man is less than one-half of what it was twenty-three years ago, and only two-thirds of what it was thirteen years ago, notwithstanding the fact that the boats and apparatus of capture used at present are far more costly and effective, and because of the higher prices the fishery is more vigorously prosecuted than was formerly the case; also the gross incomes of the oystermen are constantly decreasing, being now less than two-thirds of what they were in 1870, notwithstanding the greater expenses which they incur.

In the meantime another and more serious change has taken place. The fishery being more extensively followed year after year, sufficient time is not given the oysters to attain their full growth, resulting naturally in a decrease in the average size of those brought to market. This decrease has been very noticeable, and the following tabular statement is presented, exhibiting for a period of years the proportion of "extra selects" among the Chesapeake oysters handled by Messrs. Platt & Co., one

of the largest raw-shucking firms in Baltimore, this probably being an average for all the dealers in that city:

Season.	Proportion of extra selects to total quantity.	Season.	Proportion of extra selects to total quantity.
1883–84	1/10	1888–89	1/43
1884–85	1/4	1889–90	1/33
1885–86	1/25	1890–91	1/50
1886–87	1/37	1891–92	1/60
1887–88	1/33		

No statistics are available with which to exhibit the comparative sizes of the oysters caught prior to 1883; but if the very general complaints prevalent throughout the Chesapeake during the last decade in reference to the decreased size of the oysters are well grounded, it is evident that the decrease since 1870 has been very great. This decrease in the size of the oysters is of more consequence than its effect on the markets or on Maryland's prestige as a producer of superior-grade oysters. It is a principle in the economy of nature that a species should be reproduced by the best developed and hardiest of its kind. On this principle the progeny of a colony of oysters not yet attained mature development can scarcely be expected to be so vigorous and capable of combating the many adverse agencies to which these mollusks are subjected as those of a well-stocked reef of large brood-oysters. The condition of the industry, as indicated by this decreasing abundance and reduced size of the mollusks, the decreasing incomes of the fishermen and increasing prices of the oysters, demands the serious consideration of every well-minded citizen of Maryland, whether he be actively engaged therein or not. Already the price of the Chesapeake oysters is so high and the size so small that a number of Baltimore marketmen are required to purchase largely from other coastal regions, one firm alone in one year purchasing $70,000 worth of large oysters in Northern States.

The general assembly of Maryland has not permitted this condition to come about without endeavoring to prevent it; and the opinion, existing to some extent, that this State has exercised no care toward conserving and preserving her natural oyster beds, is without foundation in fact, for she has expended more effort than any other American State toward protecting and preserving the public reefs, to which may be due the fact that they are now in better condition than those in most other States. I believe that there has not been a single protective or restorative measure, giving assurance of benefit to the free or common fishery, adopted by any government in America or Europe, that has not at some time been operative in whole or in part of Maryland. From 1820, when "well-grounded apprehensions were entertained of the utter extinction of oysters in the State," up to the present time, by means of close seasons, interdiction of supposed injurious modes of fishery, and other restrictive measures, the State has constantly endeavored to conserve and protect the common fishery.

The stationary life of oysters, tending to facilitate their removal from the beds, is resulting in a depreciation of the free fishery in all civilized countries, notwithstanding severe protective laws, no community having yet learned the secret of preserving undiminished the prosperity of the public beds. It is to be regretted that no data are available by which to compare the extent of the common and private oyster fish-

eries. The growth of the latter during the last twenty years has been marvelous. At present scarcely one-half of the world's product of oysters is marketed directly from the public reefs, the quantity going upon the food market from Maryland being greater than that from all the remaining public beds of the world combined. Witnessing the continued depletion of their public reefs in spite of their protective laws, States and countries have grown weary of their task of attempting to preserve them and have encouraged the investment of private enterprise on barren grounds, making the regulations of the common fishery subsidiary thereto.* In Maryland, however, there are so many thousands of persons dependent on the common fishery, and its prosperity is so important a factor in the wealth of the State, that it has received every safeguard that presented a possibility of benefit, so far as the leaders in State legislation could conceive and carry out. And the regulations and sentiment that now surround the industry in Maryland are such that if ever the common oyster fishery on the public reefs becomes a thing of the past in America, I feel confident that its last battle ground will be along the shores of the Chesapeake.

The great trouble with the present methods and regulations is not with the close seasons or with the implements employed, but, as in other States, the oystermen take no individual interest in the preservation and development of the reefs on which they work, their sole object being to obtain at the moment all the oysters possible, without reference to the future supply. Individual interests clash with the public good. While it is the public or general interest of all that each oysterman should refrain from taking the small and poor oysters, take few during bad markets, and give attention to removing enemies and leaving the reefs in the best condition for further reproduction and growth, it is his individual but temporary interest to take all he can get, big and little, fat and poor, in good markets and in bad markets, and with the least possible expenditure of time. As with other men, the individual gain of to-day outweighs the public good of to-morrow.

An instance of the manner in which the public interest suffers at the hands of individual benefit may be cited in the cull law enacted in 1890, which required that all oysters measuring less than 2½ inches in length should, when caught, be returned at once to the water. It is generally admitted throughout the Chesapeake that could this regulation be enforced it would be more beneficial to the public reefs than any other oyster enactment ever made by the State. But as these small oysters, measuring from 1 to 2½ inches, are worth about 20 cents per bushel it is the temporary interest of each oysterman to sell them at the shucking-houses or for planting in other States, and as there are over 8,000 vessels and boats at work, it is obviously difficult for the fishery fleet to thoroughly enforce the law.

*Many quotations similar to the following might be made from official reports:

"We find that the supply of oysters has very greatly fallen off during the last three or four years. That this decrease has not arisen from overfishing, nor from any causes over which man has direct control, but from the very general failure of the spat, or young of the oyster, which appears, during the years in question, to have been destroyed soon after it was produced. A similar failure of spat has frequently happened before, and probably will often happen again. That the best mode of providing against these periodical failures of the spat is to facilitate the proceedings of those individuals or companies who may desire to acquire so much property in favorably situated portions of the sea bottom as may suffice to enable them safely to invest capital in preparing and preserving these portions of the sea bottom for oyster-culture. * * * That no regulations or restrictions upon oyster fishing, beyond such as may be needed for the object just defined, have had, or are likely to have, any beneficial effect upon the supply of the oysters."—*Report of the commissioners appointed to inquire into the sea fisheries of the United Kingdom, 1866.*

Under the present regulations of the fishery the number of very small oysters (under 1 inch in length) destroyed frequently equals the number of large ones utilized. Attached to the shells of the large oysters will occasionally be found many small ones from 3 to 6 months old. As many as sixty of these young oysters have been found attached to the shell of a single mature one. This number, however, is very unusual, but the proportion for the entire bay might certainly be expected to average during most spawning seasons at least one or two young oysters for every mature one. These small oysters can not be utilized in the market-houses, and when delivered there are thrown upon the shell heaps. They have already passed through the most precarious period of their existence. Their shells have become sufficiently hard and stout to resist many of their enemies, and while some of them would doubtless perish if permitted to remain on the reefs, yet the mortality among them would scarcely be much greater than occurs among mature oysters. The remedy for their protection is not apparent. A careful oyster-culturist would doubtless postpone the taking of the mature oysters until the young ones were sufficiently developed to be safely removed from their attachment, but this course is scarcely practicable on the public domain without temporary close time on the reefs.

With respect to close seasons, which for forty years have been the most popular forms of protection in America, the close time in the fall is of value because of the protection it affords the small oysters from injury from the source above noted. But the opinion is growing among the best-informed persons that the spring close time is generally of little value to the reefs; in fact, under some circumstances it would be better for the oystermen to continue their operations to within a week or so of the spawning time. Their work would render the reefs more nearly free from sediment, vegetable growth, etc., thus facilitating the attachment of the spat.

The general opinion that the disturbing of mature oysters immediately prior to the spawning time greatly injures them has little foundation. To be sure, if oysters are removed from the reefs there are so many less to perform their reproductive functions, but the same applies equally to those removed eight months before. The action of the dredges themselves is not materially injurious to those oysters left on the beds. Naturalists are well aware that the most delicate ascidians are frequently roughly dredged, and if placed in a bucket of sea water may be examined in perfect health an hour or two afterwards; and it is scarcely probable that so hardy a mollusk as an oyster, capable of being kept barreled for weeks, shipped thousands of miles, and then bedded with perfect safety, would suffer so much injury from being jostled by the dredge as to fail in performing its usual functions. However, the spring close season in Maryland is deemed valuable because of its restricting the spring trade in small oysters for bedding purposes in other States, which, however, could be effected by the complete enforcement of the cull law. It is also of benefit to the agricultural interests along the shores in making labor more abundant.

There are other conditions that encourage a depreciation of the free fishery and for which the individual oystermen are not blamable. Among these might be mentioned an entire lack of care to leave the grounds or the small oysters in a condition suitable for the growth of the latter, and an absence of any attempt to prepare the beds for the attachment of a "set" during the spawning season. But everyone will recognize the extreme difficulty of devising a system for remedying the latter evil suitable for application over large areas of the public domain.

These two provisions—protection of small oysters and placing the reefs in the best possible condition for the attachment of a "set"—are the key-notes to the proper government of the fishery on the public beds, and any system of regulation that has not these for its objects can not be expected to be of great value.

It has been proposed that certain portions of the bay—half, for instance—be closed for two or three years in order that the oysters now thereon may have time to mature, and when this area is thrown open the other be closed for a similar period, the system of open and closed districts being continued indefinitely. But there are many objections to such a procedure. When the southern half is closed it works a hardship to persons living along the shores thereof, and when the fishery is interdicted in the northern half the residents in that vicinity would consider themselves aggrieved. If, in order to avoid this objection, the size of the districts be reduced and the number of them be multiplied, it would be quite difficult to prohibit the fishery in the closed ones. Also, it has been shown that the operations of the oystermen improve the beds for spat-collecting purposes, and a stoppage of the fishery might to a material extent affect the attachment of a "set."

It seems that the only good result of such a regulation would be a restriction in the removal of small oysters, but this would be secured under present regulations by a complete enforcement of the cull law. Were the system to be adopted, the enforcement of the cull law would still be necessary, and it would increase local jealousies, already too numerous, add another to the many regulations now difficult of enforcement, and yet be of questionable value.

If there were adopted a regulation for obtaining a "set," having among its features the return to the water of a portion of the shells accumulating about the shucking-houses, it seems possible that special benefit might result from this particular feature. When one considers that, as a component part of the oyster shells, 200,000 tons of carbonate of lime are annually removed from the Chesapeake, the question naturally arises as to the continuation of the supply. When returned to the water the shells rapidly disintegrate, furnishing material for the shells of other oysters. The benefits, if any, to be derived from such provision, however, rests entirely upon speculation.

An opinion is quite current that the proper regulation of the oyster fishery in Maryland is for the State to lease or sell the natural reefs and leave to the individual owners the question of protection or improvement of their respective holdings. Under the present condition of the industry and its environments it seems that such a procedure would be detrimental to the welfare and interests of those persons dependent on that industry for support, as well as to the peace and good order prevailing in the tide-water regions of Maryland. I believe that no American State, and certainly none in which the fishery is of great consequence, has ever deemed it expedient to dispose of the public interest in any natural oyster beds. The fishery in Maryland is not, as frequently supposed, a haphazard undertaking conducted by a class of men depending for success on violations of the State laws, but is on a firm, orderly basis, any sudden, revolutionary change in which would work great hardship and distress to the thousands of citizens depending on it for a livelihood

If the cull law be vigorously and thoroughly enforced, increasing the minimum limit to 3 inches as soon as the condition of the fishery may warrant, and a proper system be adopted for preparing the reefs for the attachment of spat during the spawning season, it is not probable that an extreme disaster to the industry will early ensue.

Barren bottoms.—It is claimed by many that the utilization for oyster-culture of extensive areas of ground now unproductive would add largely to the extent and revenue of the oyster industry in Maryland.

Of the water area of Maryland about 2,000 square miles is now unproductive of oysters. In 400 square miles of this the salinity of the water is probably not sufficient for the growth of these mollusks. A very large area of the remaining 1,600 square miles is covered with grass, thick mud, sand, or is otherwise incapable of utilization with profit under present financial conditions. The area of such ground is a very uncertain quantity. In Connecticut the experience has been that only one-fifth of the water area can be profitably utilized. But three-fourths of the unused ground is in the eastern half, where the barren condition is caused by heavy storms. Should a cultivating law be adopted in Maryland the crabbing interests would doubtless demand consideration and thus further reduce the possible area. All of these restrictions would probably limit it to from 400 to 1,000 square miles, if the conditions in other States are trustworthy guides.

It is unnecessary in the present paper to discuss the practicability of oyster-culture on areas not provided by nature with those mollusks, for this is no longer a living question, it having been answered years ago in many practical ways and in innumerable waters of varying physical and biological characteristics. Already only one-half of the world's product of oysters is marketed directly from the public reefs. At present the trade in high-grade oysters is dependent on the product of private areas, notwithstanding the slight encouragements received. Nearly every celebrated variety on the American market is the product of private grounds; among these might be mentioned the "Providence Rivers," "Norwalks," "Blue Points," "Maurice Coves," "Parker Bays," "Chincoteagues," "Cherrystones," "Lynn Haven Bays," "Hampton Bars," "Stone Bays," "Bayou Cooks," etc.

In hundreds of sheltered coves, and in much of the deep waters of Maryland where the bottom is muddy or grassy, or other conditions have heretofore prevented a growth of oysters, the difficulties might be overcome and the cultivation thereof be made profitable. The harvest is not always certain, but the chances are greatly in its favor, and the profits are sufficiently large to have merited more encouragement than has heretofore been accorded the industry. The situation of the Chesapeake, between the cold waters of the North and the warm waters of the South, protecting it from great extremes in temperature, is favorable to oyster-culture. Except in the extreme southern portion, this bay is also comparatively free from the severe storms and predaceous enemies that effect such enormous destruction on the oyster beds of Northern States.

Localities favorable to the development of oysters are not always best adapted to their reproduction, and places where oysters breed rapidly are sometimes not favorable to their growth. Generally the growth of oysters is practicable in waters having less saline constituents than appears necessary for breeding purposes. There is probably no locality of equal area in America, if in the world, in which oysters are produced in such numbers as on the flats on the sea side of Accomac and Northampton counties, Virginia; yet, if left on their native grounds, they scarcely ever exceed 2½ inches in length. The famous "Kettle Bottom" oysters of the Potomac River are of great size, but do not breed in abundance there. Under the present regulations in Maryland grounds suitable for the growth of oysters, but not adapted to their reproduction, are idle and barren, but under a planting system might be utilized with profit.

Suitable regulations for ostreiculture could be adopted which, without working change or injury to the present free fishery on the public reefs, would permit the development of this industry for the employment of the idle labor of the State. They should meet with the approval and have the encouragement of the present oystermen of the Chesapeake. The cultivating systems here outlined are by no means antagonistic to their interests; on the contrary, they more than any others are to reap the benefits. These men are familiar with the bay; they are familiar with the character of the grounds and with the methods of handling oysters; they are already fitted out with boats and implements for engaging in the business. They could acquire an area of ground which they could take pride in cultivating and improving, in adding to from year to year, and something on which they might depend in their old age.

There should be no fear of outside capitalists, monopolies, etc. There has probably never been an instance in which, after a State has adopted a cultivating law, the trade has been controlled by men from other States, if any attempt has been made to prevent it. On the contrary, in New Jersey, New York, and Connecticut many of the men who at present own the large oyster farms, the fleets of vessels, and employ the greatest number of men, were formerly public-reef tongmen and dredgers. The members of a certain firm in Connecticut, who in six weeks gathered from its beds 160,000 bushels of oysters valued at $110,000, were public-reef oystermen eighteen years ago.

There is no warrant for concluding that the most extreme protective or restorative regulations that the State could adopt would preserve the common fishery from depletion to such an extent that there will be scarcely a subsistence for the men engaged therein. Numerous acts of assembly exist for protecting the oyster fishery on the public reefs of the United States coast north of Cape Cod, but not an acre of oyster-ground now remains to give operation to those regulations. The fishery from Cape Henlopen to Cape Cod has had even further restrictions, but at present scarcely one-twentieth of the 7,000,000 bushels of oysters produced annually in that region are marketed directly from the public reefs. France has witnessed the depletion of certain of her valuable reefs even when the fishery thereon was restricted to fourteen days in the year and three hours in the day. Already distress exists at times in several isolated localities in Maryland, because of the decrease in prosperity of this industry, and this is possibly a foreshadow of what will, in course of time, prevail in every tide-water region of the State if the present unfavorable conditions of the fishery continue without the possibility being given the oystermen for adding to their incomes by the investment of individual enterprise. Other than this no prospect appears for a great improvement in the condition of the fishermen, and the only heritage they now have to leave their sons is contained in their small boats and a training for engaging in a vocation already barely affording a livelihood and with a prospect of continued decrease.

But the benefits to be derived from a proper system of private oyster-culture would not be confined to those persons engaging in it or to those handling the products of the private areas, or to the increased amount of money disbursed along the shores. If the common fishery were still properly protected and regulated, private ostreiculture on present barren bottoms would, it seems, be of benefit to the public reefs and to the men operating thereon, even though the latter should never engage in growing oysters for themselves. The foundations for this statement are here cited:

1. It is well known that the removal of medium-sized oysters to more favorable feeding-grounds on which they may remain several months greatly increases their

market value, and if a planting industry were established the small or poor oysters would find a much better market among the planters than at the shucking-houses. The oysters referred to are those measuring 2½ inches and over, for it is assumed that no change will occur in the present regulations of the common fishery so far as the cull law is concerned.

2. The cultivators would doubtless remove predaceous enemies from their areas and this would decrease the number left to feed on the public reefs.

3. If by reason of fishery or natural effects the oysters on a public reef should be so fully removed or destroyed as to not leave sufficient for breeding purposes, the proximity of private oyster beds would supply the deficiency in spat.

4. By engaging the attention of a number of the oystermen it would to some extent relieve the public reefs of the extensive fishery to which they are now being subjected and leave a greater quantity of oysters for those persons continuing to resort to those areas.

Ostreiculture in some States has to contend with an adverse movement brought on by its supposed friends rather than its enemies. The profits of few vocations have been so extravagantly represented as those of the one under discussion. The enthusiastic amateur agriculturist who writes on "5 acres enough," has his counterpart in the field of ostreiculture. Reports evidencing great labor in preparation have gravely predicted an average annual product in Maryland of hundreds of millions of bushels of oysters under a wise system of regulations. The adoption of a system of oyster-culture dependent for its success upon the realization of such expectations would doubtless result in failure. The conditions of aquiculture in this country, or in any other country, do not warrant such anticipations, and they have done much to retard the adoption of a practicable system of regulation for private oyster-culture in many States. These extravagant ideas of production are not understood by the bay men, and their acceptance by persons unfamiliar with the growth of oysters leads to a difference of opinion which can be reconciled only when the truth of the subject is understood. It has resulted in the development of the feeling that the present barren bottoms are of enormous value, and should be parted with only at prices so high that persons of small resources can not obtain them, and renders the development of extensive ostreiculture thereon impracticable.

It is questionable whether there is a single square mile of water area in America that has produced annually during the last ten years 400 bushels to the acre. It is true that there are many planting areas from which even 1,000 or more bushels to the acre are annually removed. But the oysters are not produced there; being obtained elsewhere, they are bedded in the spring and are taken up during the succeeding winter. They are little more the produce of those areas than are cattle slaughtered in abattoirs the product of the few acres of grazing land attached thereto.

The system of private oyster-culture at present practiced in Connecticut is admired by every one familiar with it. It has resulted in creating a new industry for the employment of capital and labor, in distributing $1,000,000 annually among the workmen along the shore of that State, and extending and cheapening the food resources of the country. Yet the average annual yield of the 60,000 acres held by individuals is only 25 bushels per acre. About one-half of this area, however, is not utilized, and the cultivated portion yields annually about 50 bushels per acre. The tax imposed by that State is about 10 cents per acre, and should this be increased to

the figures proposed for adoption in some States, it would doubtless at once result in a great reduction in the extent of the industry, notwithstanding the fact that it is now on a well-established basis.

Frequent reference has been made to what is being accomplished in Rhode Island in the collection of an annual rental of $10 per acre from certain sea bottoms, and this is used as a basis for the valuation of similar areas situated elsewhere. There are about 600 acres of ground in that State rented at this rate. They do not produce oysters but are used for planting purposes, the oysters being bedded in the spring and removed during the succeeding winters. Because of the high rental, little attempt is made towards the production of oysters, the plants being purchased from other States, and even the extent of the bedding trade is said to be curtailed thereby, it now being less than one-half as extensive as it was in 1880. It is true that the State treasury has received about $6,000 annually, but if the taxes on the ground had been more reasonable Rhode Island might at present have sufficient oyster-producing farms to keep within that State the $150,000 annually paid by the planters therein to the oyster-growers of other States, and to cause the receipts of the State treasury to equal those of the present.

The imposing of high taxes on oyster-grounds renders it financially impracticable to utilize them for any purpose other than the bedding of oysters, shifting them from one locality to another, which is not true oyster-culture.

In an address delivered at Baltimore January 18, 1891, the following expression of opinion was made by Hon. Marshall McDonald, United States Commissioner of Fish and Fisheries, who has given close attention to aquiculture in all its branches:

> In the case of that broad area of sea bottom which at present yields nothing to production, it would, in my judgment, be wise on the part of the State to permit its entry under conditions similar to those which are prescribed for the public lands of the State above tide.
>
> The man engaged in oyster production should be harassed by no imposts or special supervision. He should be treated as is the farmer, protected in his rights of property, and his investment required to bear equally with the lands above tide the burdens of taxation. The State should seek to derive its revenue not from any special tax or from extravagant prices for sales or entry, but from the vastly increased valuation which would be given to these lands when the opportunity for their improvement is afforded.

There is a greater area of sea bottom in the United States suitable, if properly prepared, for the growth of oysters than any probable market demand can utilize. The Atlantic coast States are wealthy in barren sea bottoms available for the culture of oysters, but most of these States are so neglectful of giving proper encouragement to the development of them that only in few places are they of great financial value. A broad system of ostreiculture demands more facilities than a restriction to 5 or 10 acres along the shore at high rental and with temporary tenure.

Not only does successful ostreiculture require sufficient areas on which to operate, but it must be surrounded with favorable market and financial conditions. Texas, with its characteristic generosity, authorizes each citizen of the State to preëmpt for oyster culture 60 acres of sea bottom without cost and without taxes, yet not one-hundredth of its bay bottoms are being so utilized. In 1889 North Carolina threw open to her citizens 800,000 acres of barren ground under favorable preëmption conditions, yet only one-thirtieth of this area has been located. The condition in Georgia is much the same. The Middle and New England States, with long-established oyster trades,

have been more successful in having their sea bottoms preëmpted and successfully utilized.

The physical, financial, and market conditions in Maryland are such that judicious encouragement could almost at once place her in the head ranks of oyster-cultivating States; order and industry would spring up where there is now but a barren waste; thousands of men now almost idle could be given employment; relieving the labor market of this surplusage would benefit the laboring classes in all industries of the State; while the oystermen at work on the public reefs, without being in any respect molested in their present occupation, would have an opportunity for building up a kindred industry to add to the support obtained from the common fishery.

CHRONOLOGICAL LIST OF PUBLICATIONS RELATIVE TO THE OYSTER INDUSTRY OF MARYLAND.

1858—Oyster trade of the Chesapeake. De Bow's Commercial Review, pp. 259–260, vol. 24.

1865—Étude sur l'industrie huitrière des États-Unis. Par M. P. de Broca. Paris, Challamel, 1865. 12mo, 266 pp. Translated in part on pp. 271–319 of Report of the U. S. Fish Commission for 1873–74 and 1874–75. Washington, 1876.

1869—Oysters of the Chesapeake—their propagation and culture. pp. 341–347 of Report of the Commissioner of Agriculture for 1868. Washington, 1869.

1870—Report upon the oyster resources of Maryland to the general assembly. By Hunter Davidson, esq., commander State oyster police force. Annapolis, 1870. 8vo, 20 pp.

1872—Report on the oyster fisheries, Potomac River shad and herring fisheries, and the water fowl of Maryland, to his excellency the governor and other commissioners of the State oyster police force, January, 1872. Annapolis, 1872. 8vo, 48 pp.

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1878—Oyster beds of the Chesapeake. Nature, New York, vol. XVIII, October 17, 1878, page 653.

1880—Report of the commissioners of fisheries of Maryland, January, 1880. Annapolis, 1880. 8vo, LXXVIII pp.

Constituting an appendix to the preceding are the following two articles:

Development of the American oyster. By Dr. W. K. Brooks. 104 pp., with 10 plates.

Extracts from report of Francis Winslow on investigations of oyster beds in Tangier and Pocomoke sounds and parts of the Chesapeake Bay. pp. 105–219.

1881—The history and present condition of the fishery industries: Tenth Census of the United States. The oyster industry. By Ernest Ingersoll. Washington, 1881. 4vo, 252 pp., 22 plates.

1881—Deterioration of American oyster beds. By Francis Winslow. Popular Science Monthly, New York. Vol. XX, pp. 29–43, 145–156.

1881—An account of experiments in oyster-culture, and observations relating thereto, made at St. Jerome Creek, Maryland, during the summer of 1880. pp. 1–66 of appendix to report of the Maryland fish commission. Hagerstown, Md., 1881.

1882—Report on the oyster beds of the James River, Virginia, and of Tangier and Pocomoke sounds, Maryland and Virginia. By Francis Winslow. Appendix No. 11. Report for 1881, U. S. Coast and Geodetic Survey. Washington, 1882. 4vo, 87 pp., with plates and chart.

1883—Chesapeake oyster beds. Science, New York, vol. 2, 1883, page 440.

1884—Present condition and future prospects of the oyster industry. By Francis Winslow. pp. 148–163 of Transactions of the American Fish-Cultural Association; thirteenth annual meeting. New York, 1884.

1884—Report of the oyster commission of the State of Maryland. January, 1884. Annapolis, 1884. 4vo, 183 pp., 13 plates, 4 charts.

1884—Report of the oyster commission of the State of Maryland. January, 1884. Baltimore, 1884. 4vo, 193 pp., 13 plates, 4 charts. [A reprint of the foregoing.]

1885—Report of operations at St. Jerome Station in laying out oyster ponds by the steamer *Fish Hawk* in 1883. pp. 1153–1156 of Report of U. S. Fish Commission for 1883. Washington, 1885.

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1893—Maryland—its resources, industries, and institutions. Prepared for the board of World's Fair managers of Maryland by members of Johns Hopkins University and others. Baltimore, 1893. The oyster and the oyster industry, pp. 264–312.

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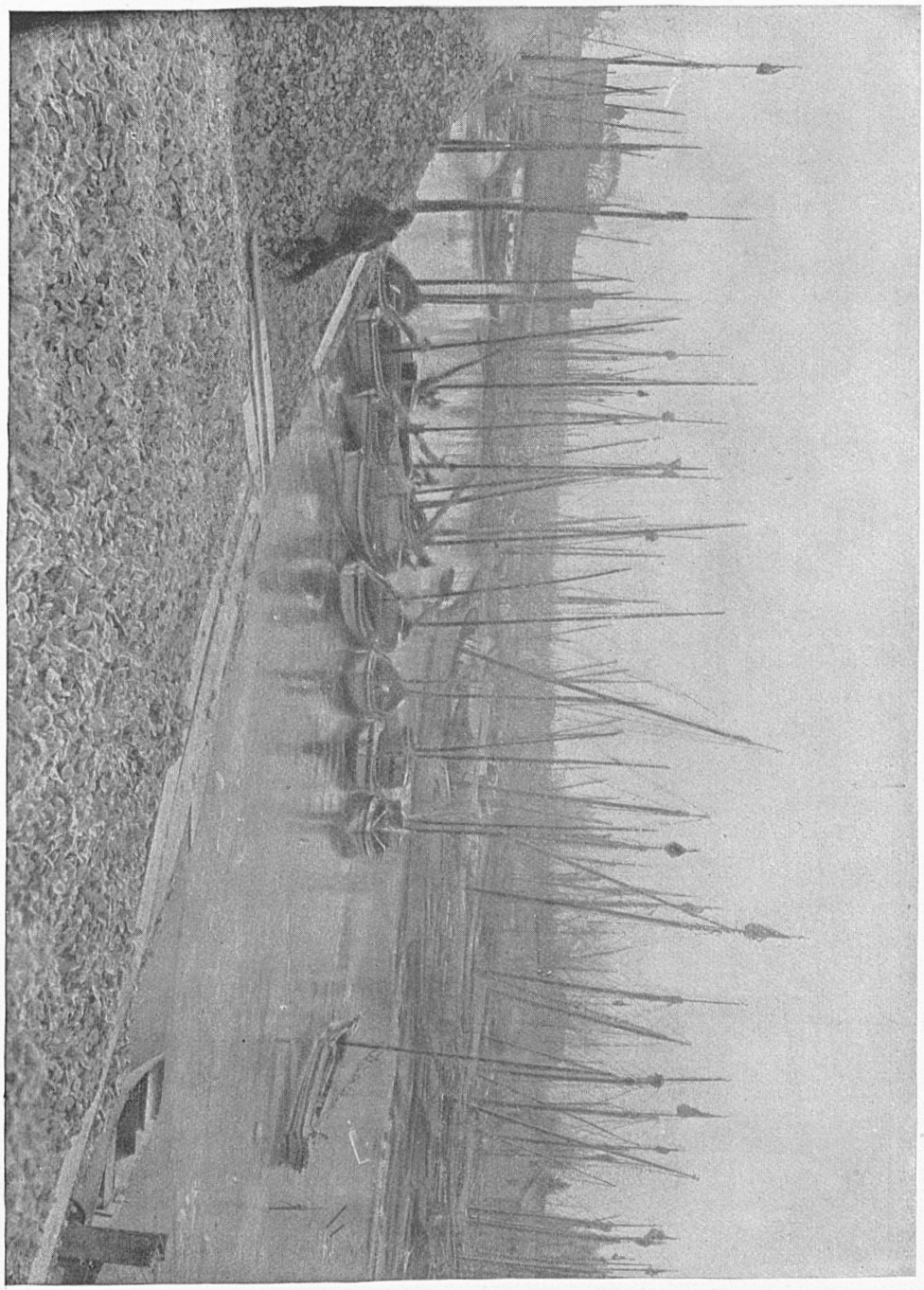
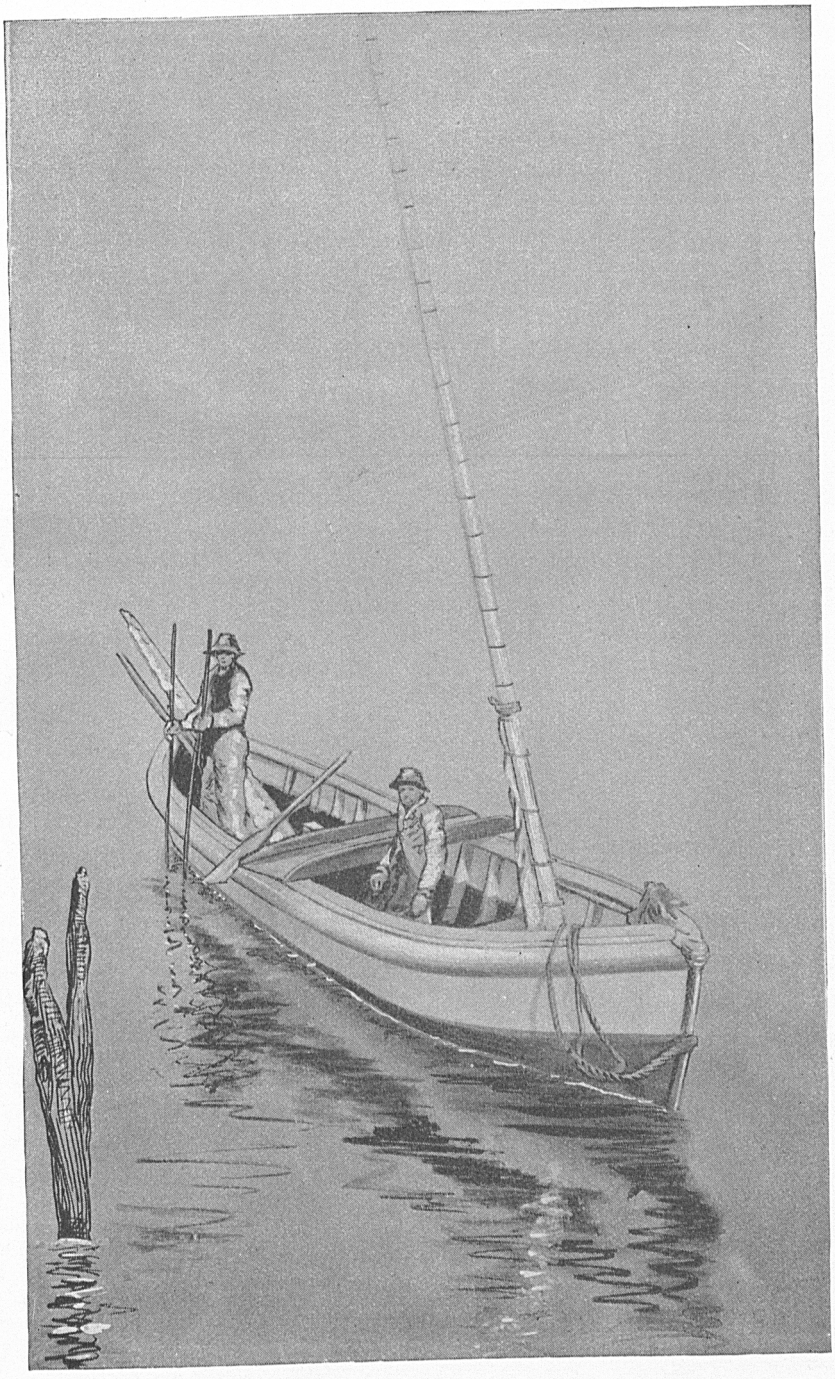
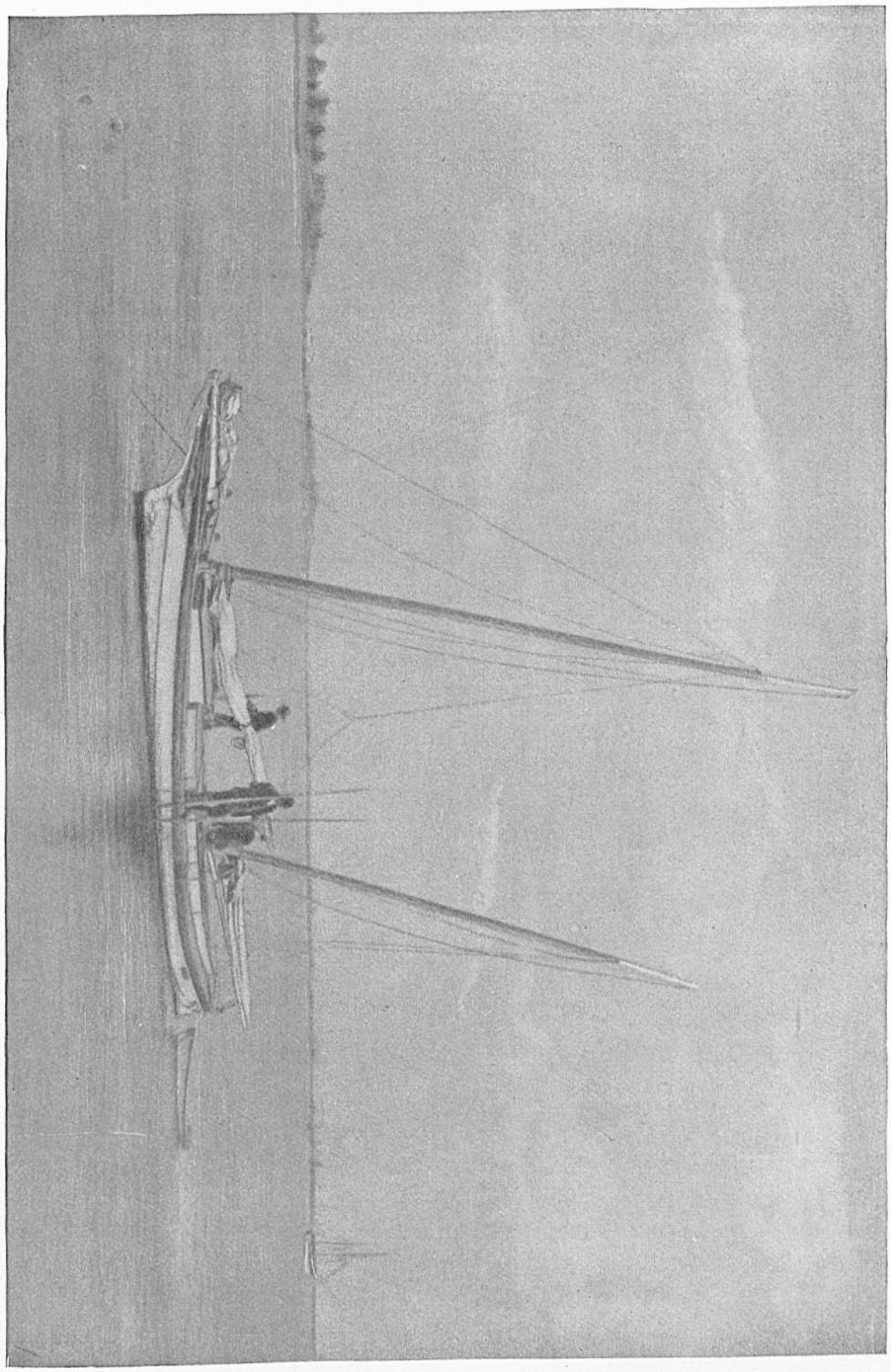


OYSTER VESSELS AND BOATS FROZEN-UP AT A MARYLAND OYSTER PORT.



CHESAPEAKE BAY TONGING CANOE.



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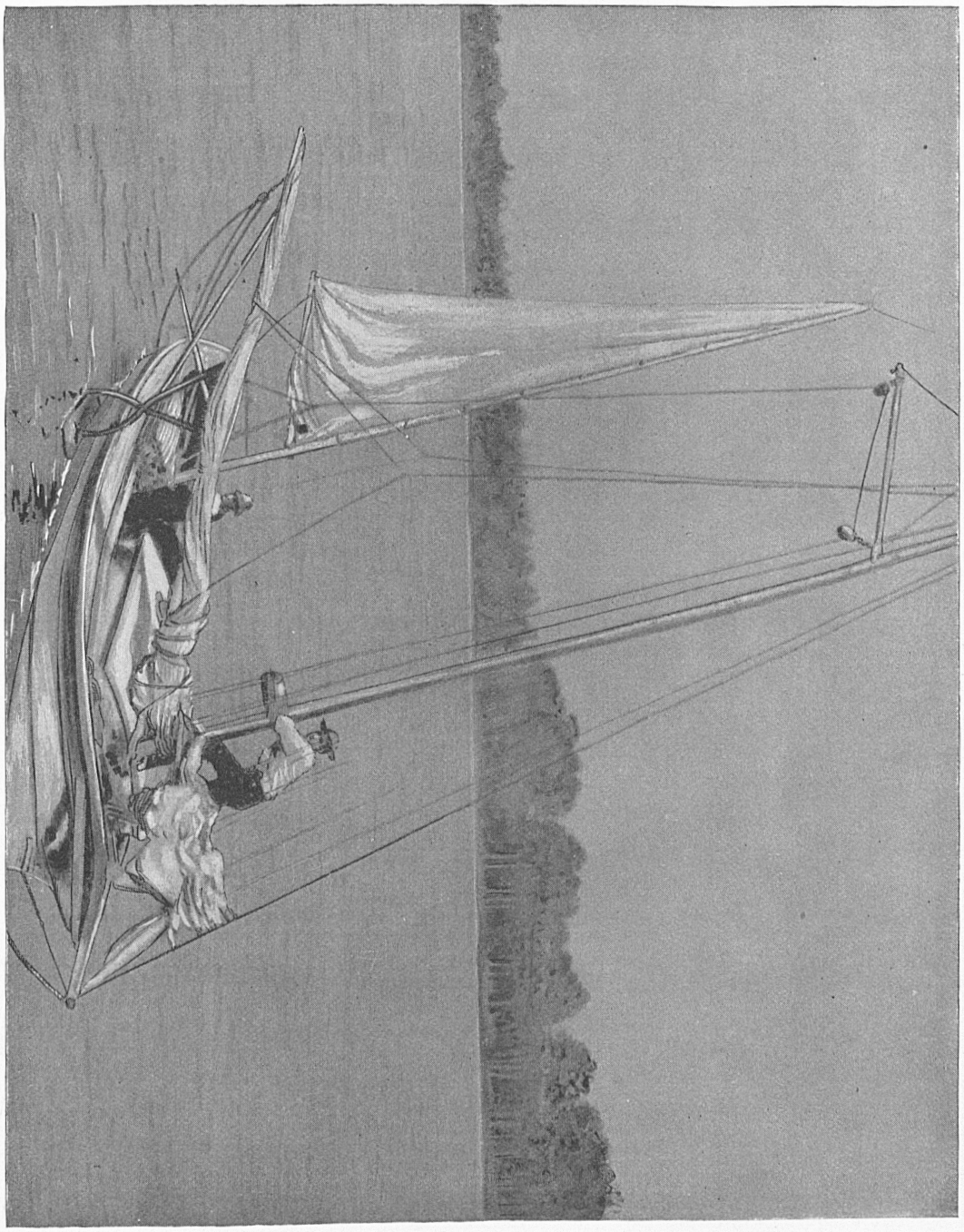

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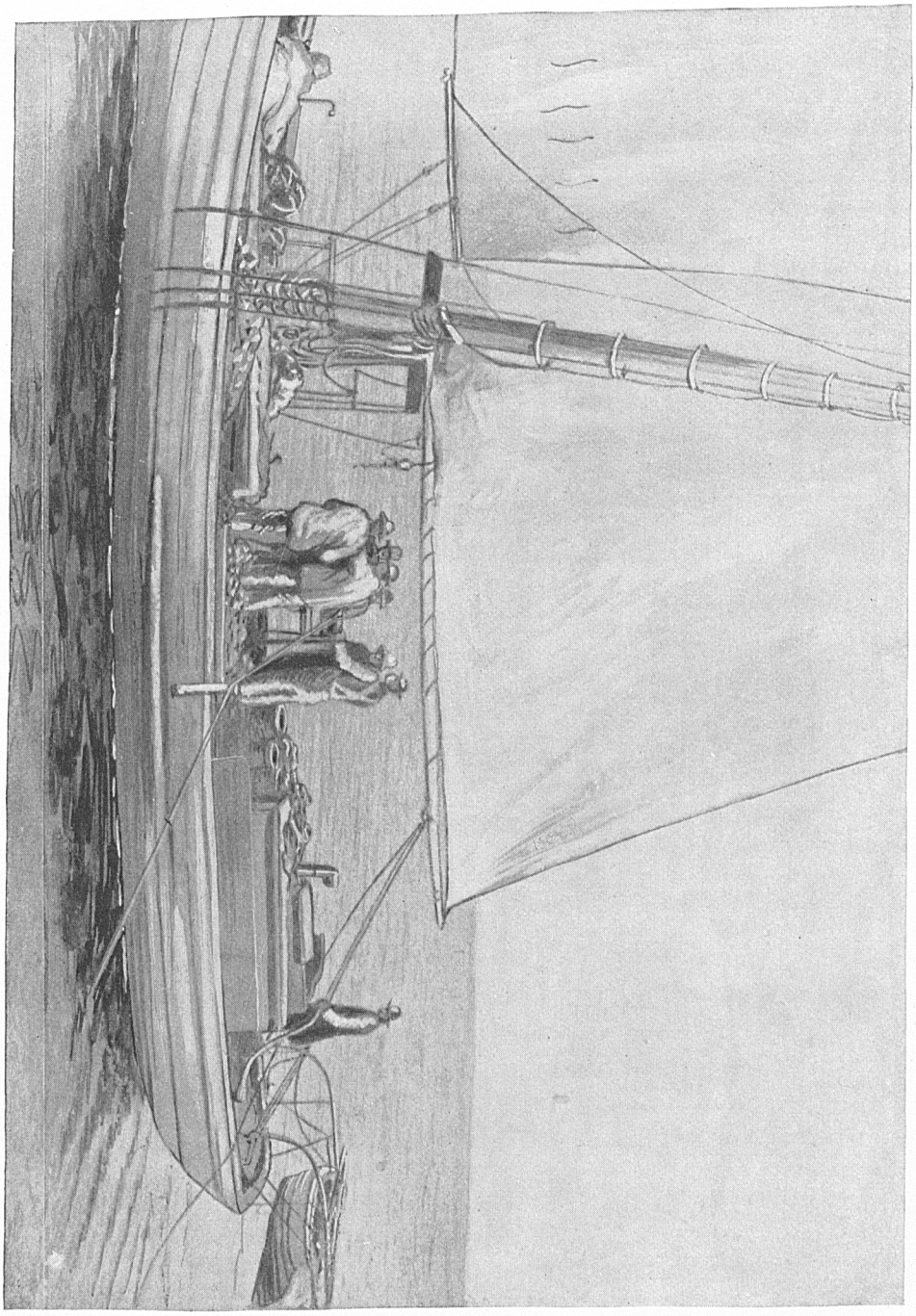

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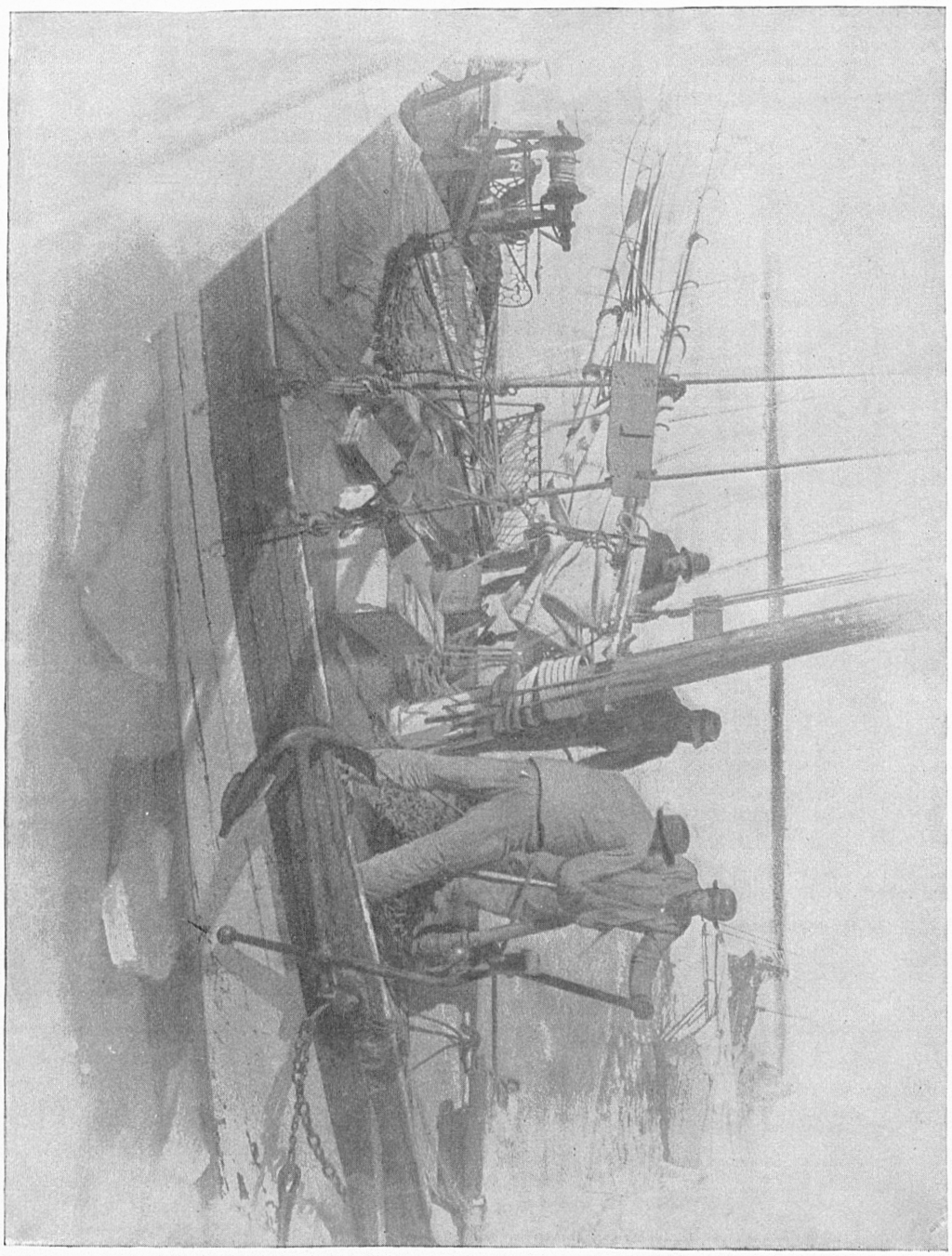
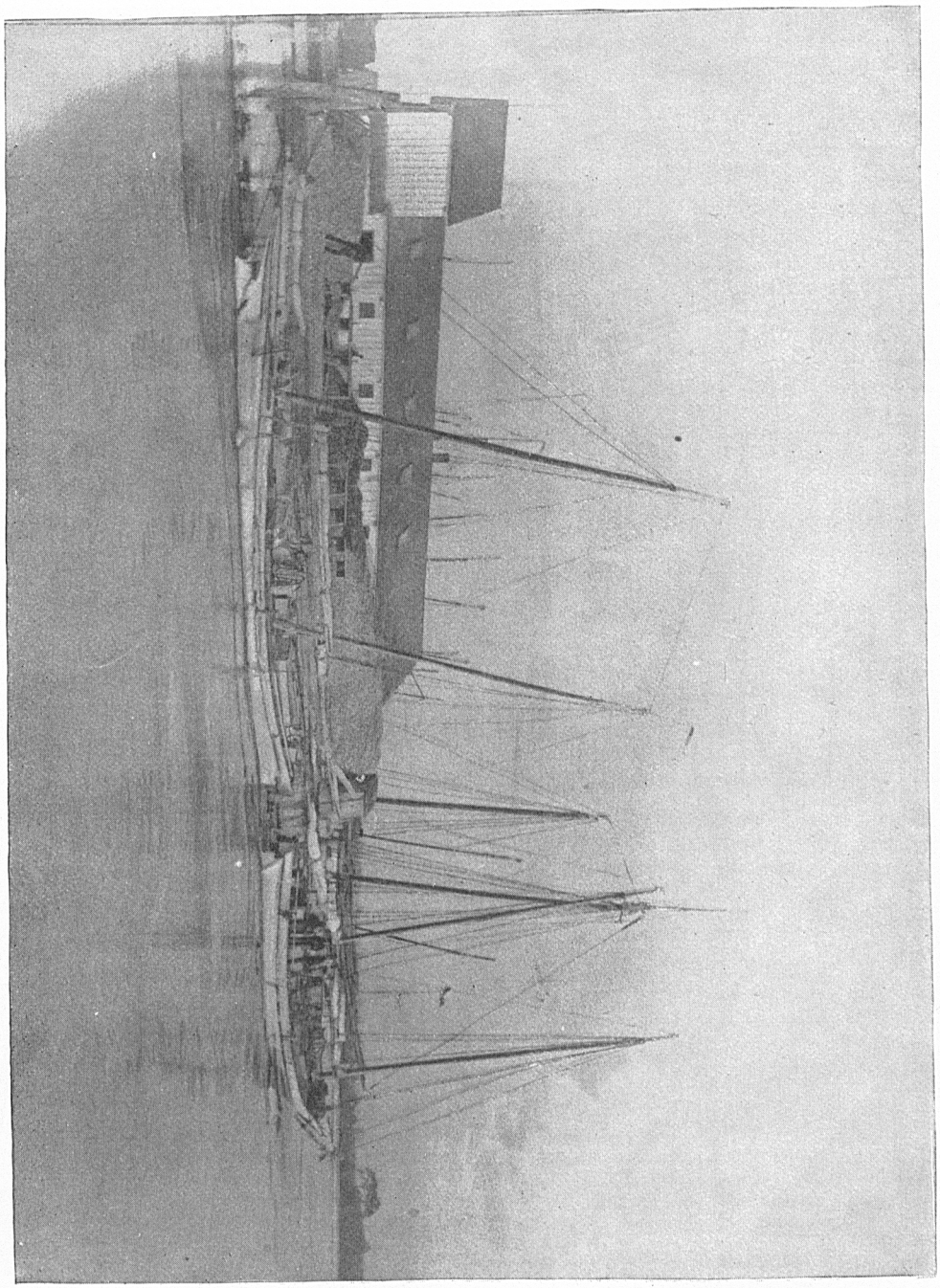
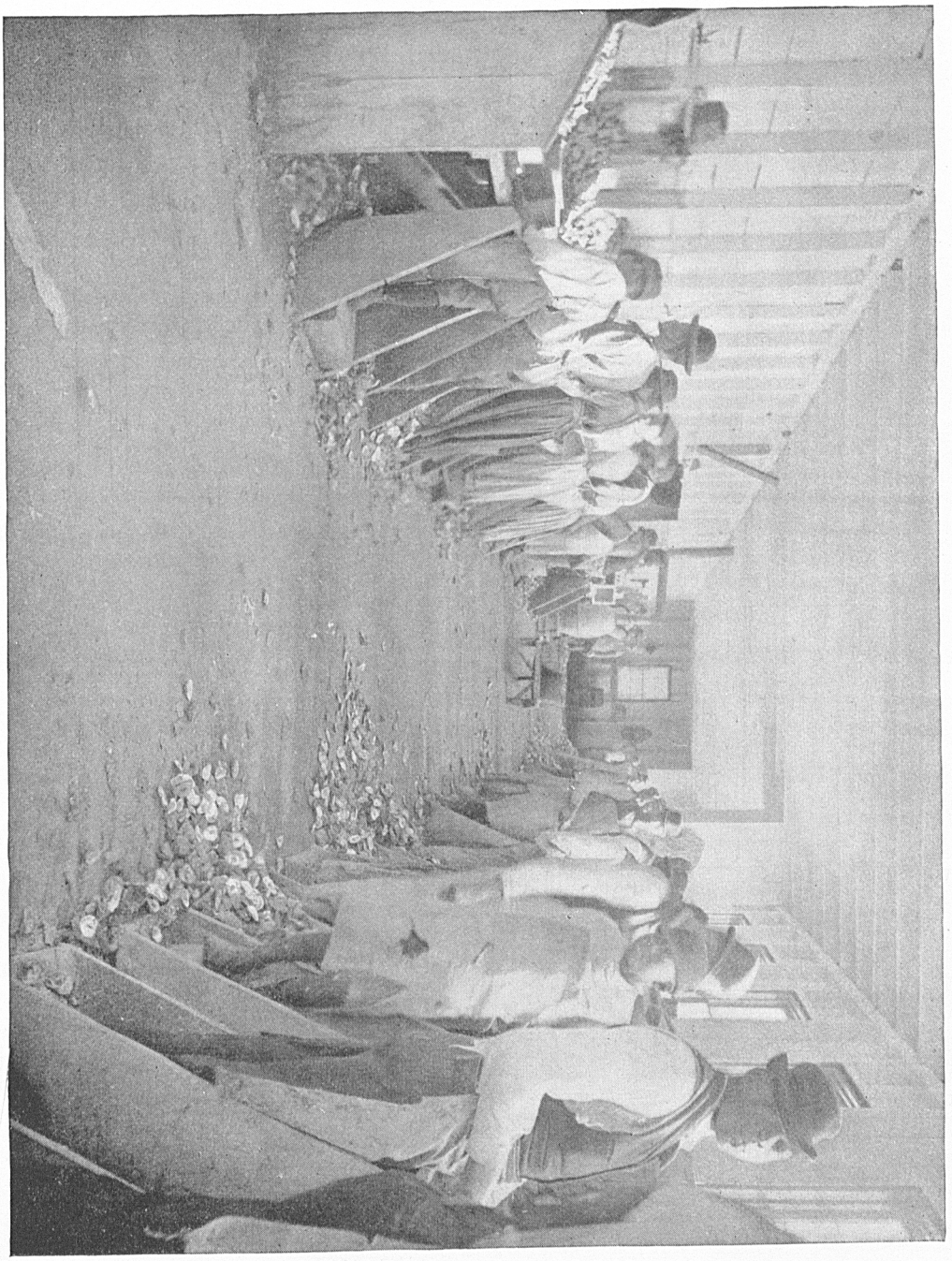


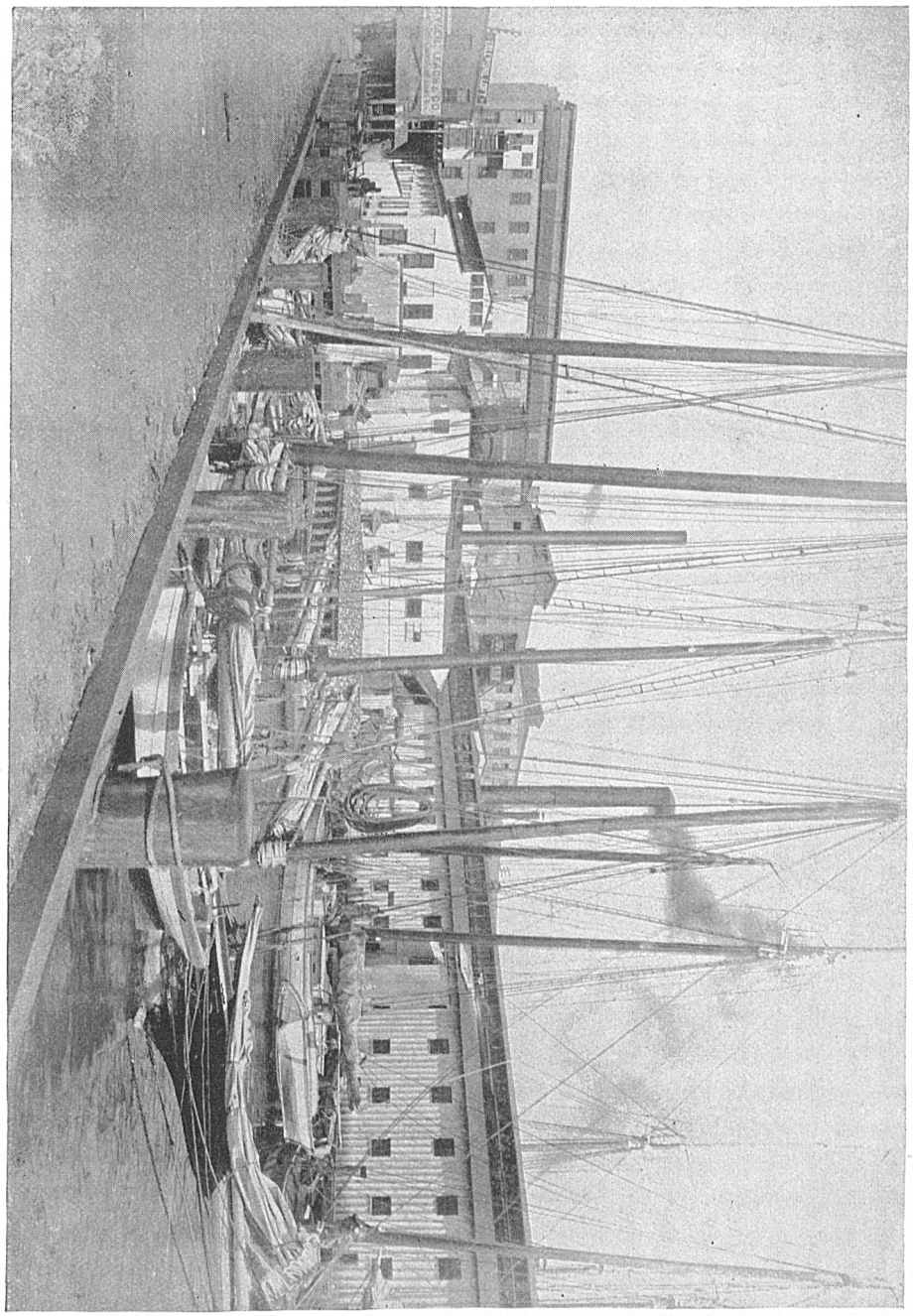
DREDGING VESSEL WORKING OUT OF ICE-BOUND HARBOR.



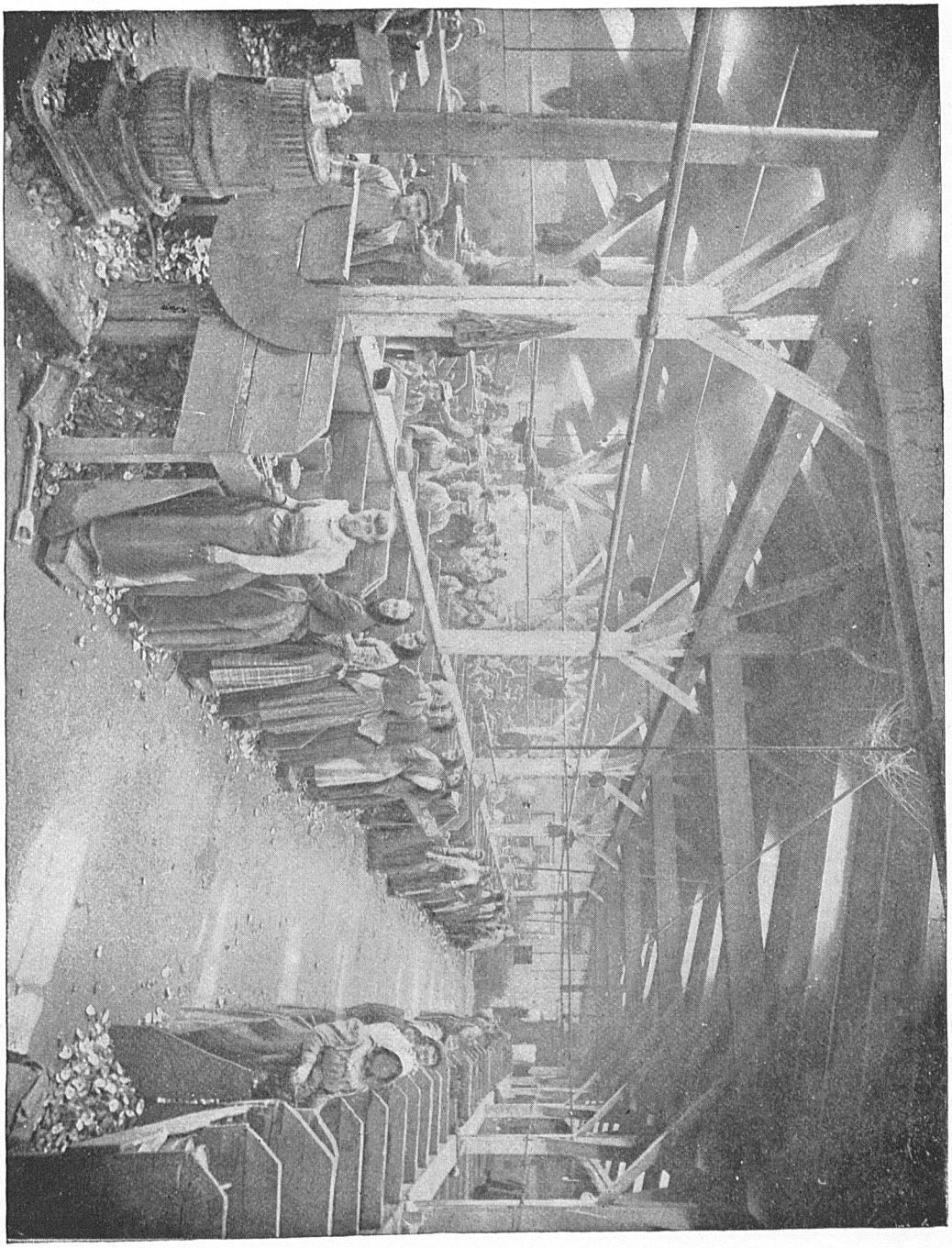
OYSTER-SHUCKING ESTABLISHMENT AT ONE OF THE "DOWN-THE-BAY" MARKETING PORTS.



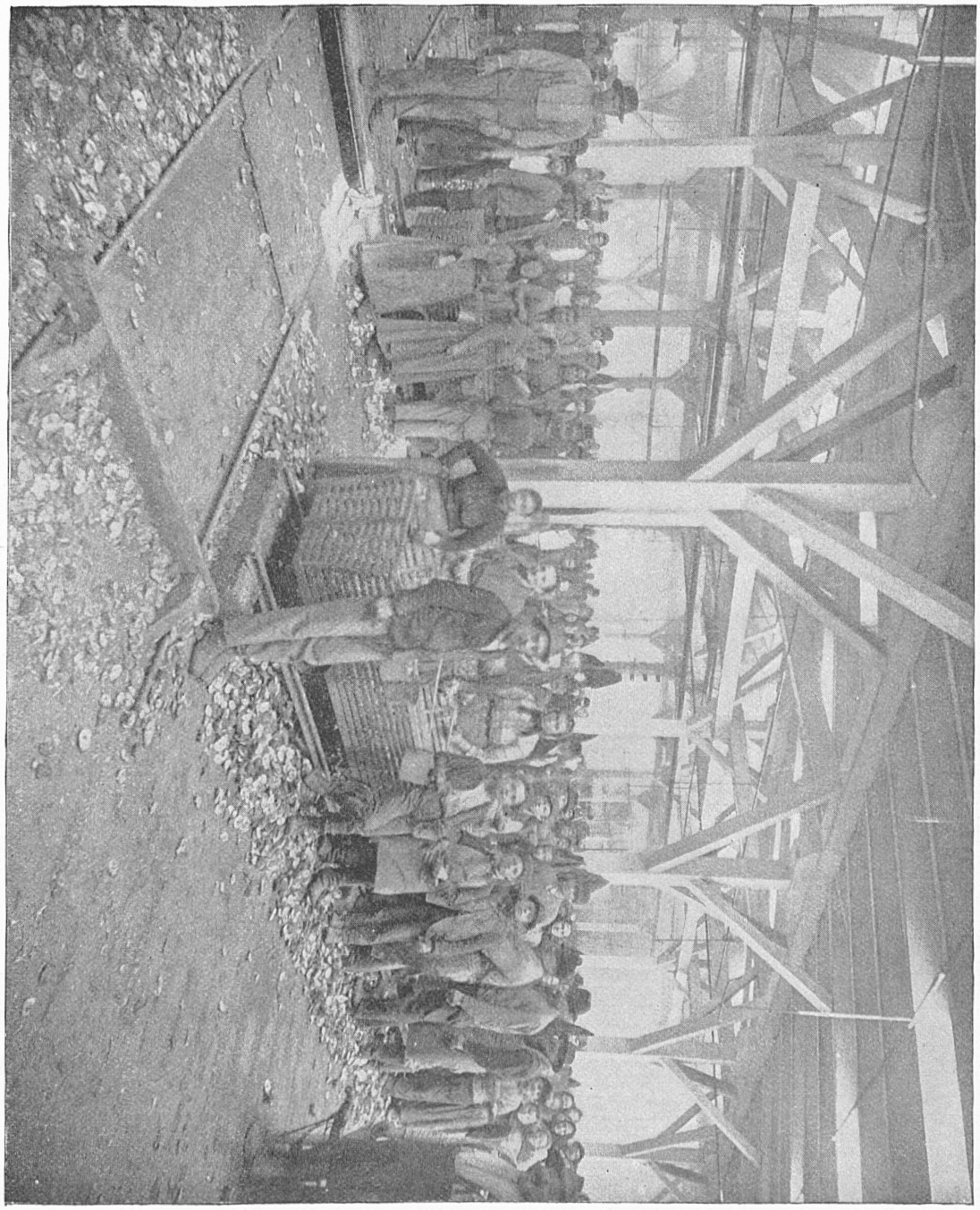
INTERIOR VIEW OF A "DOWN-THE-BAY" SHUCKING ESTABLISHMENT.



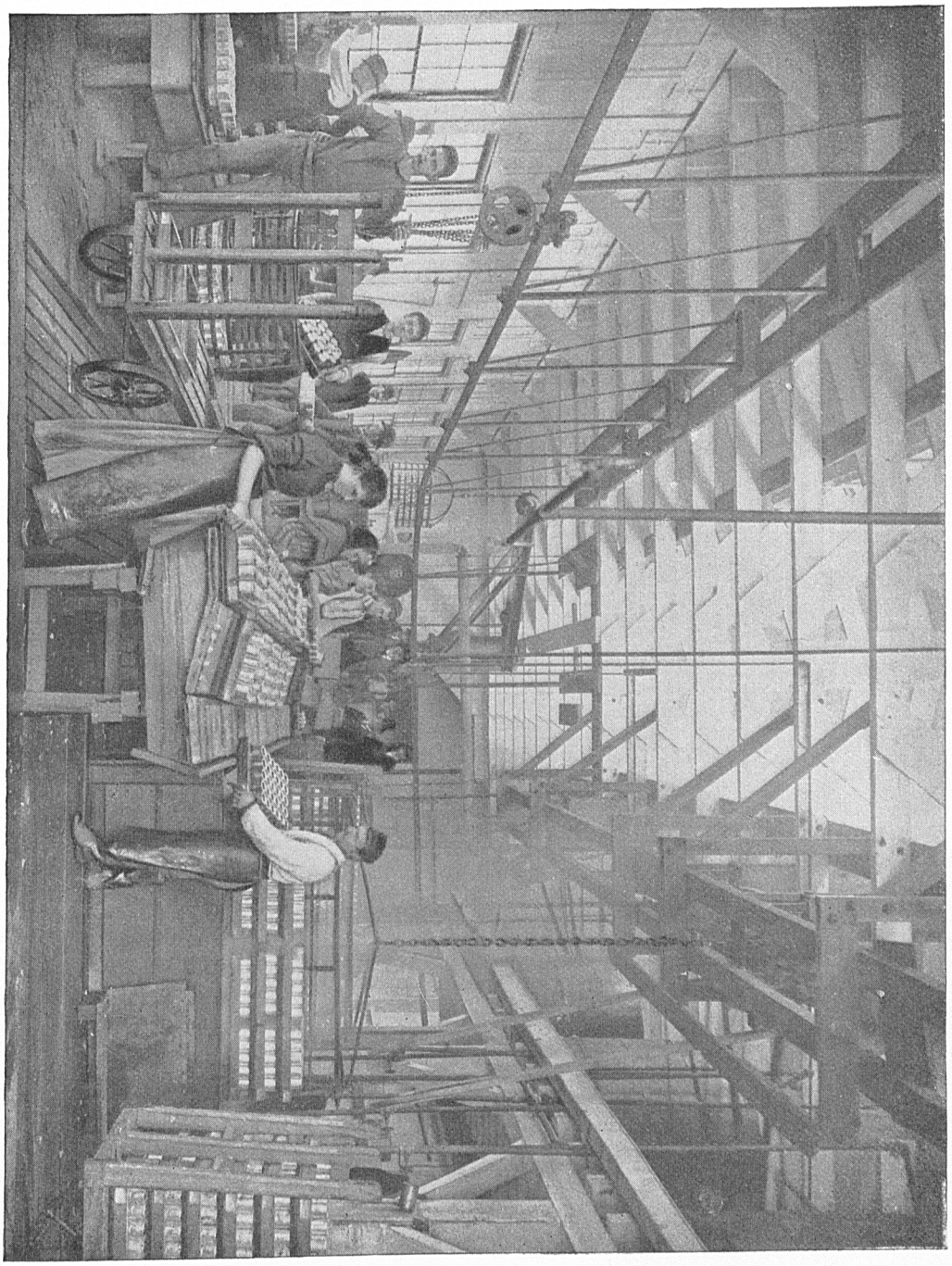
OYSTER-MARKETING ESTABLISHMENT AT BALTIMORE.



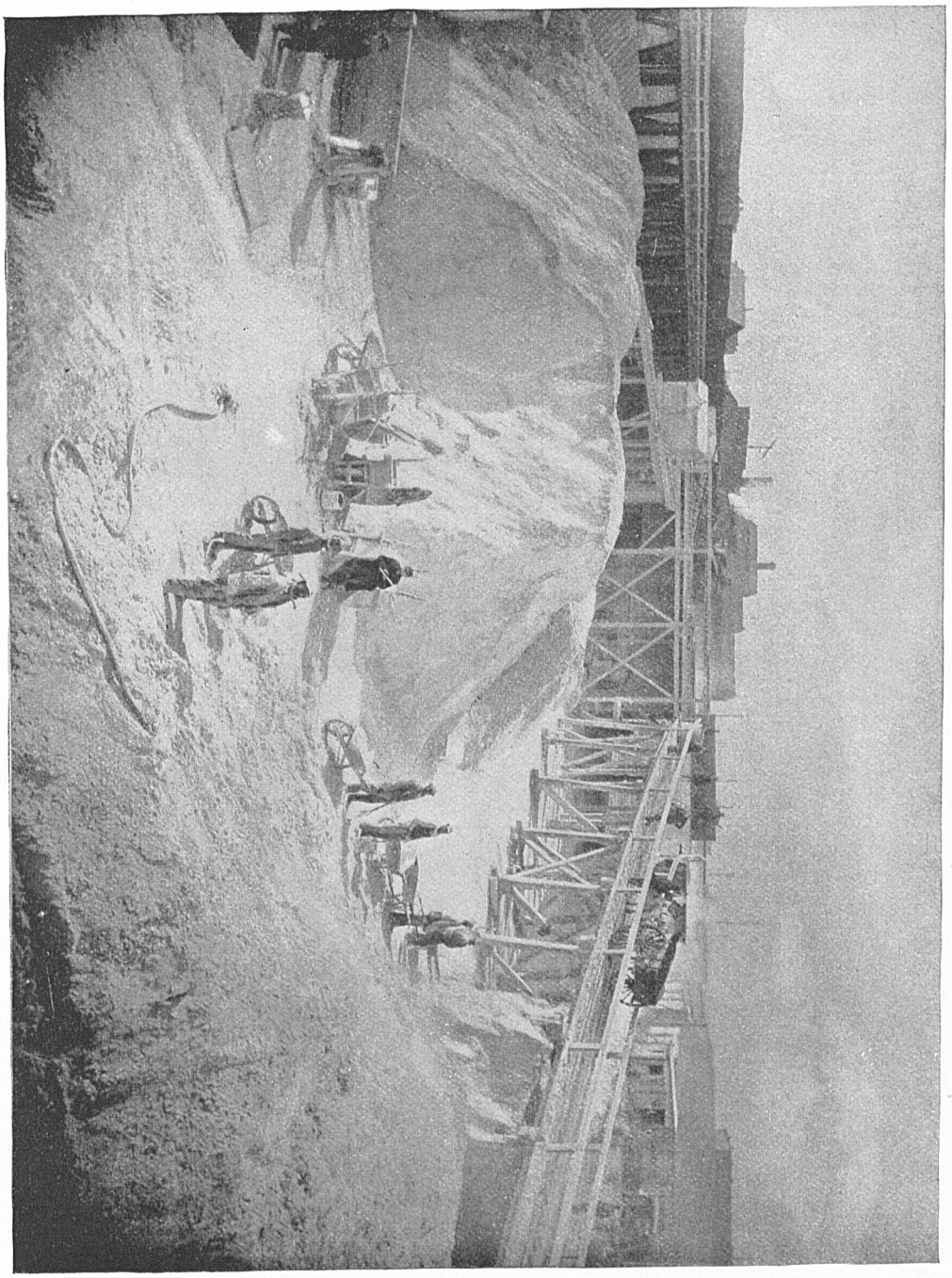
SHUCKING ROOM OF A BALTIMORE MARKETING HOUSE IN THE RAW TRADE.



SHUCKING ROOM OF A BALTIMORE OYSTER-CANNING HOUSE.



PROCESSING ROOM OF A BALTIMORE OYSTER-CANNING HOUSE.



LIME YARD ATTACHED TO A BALTIMORE MARKETING ESTABLISHMENT.