29.—THE PAST, PRESENT, AND FUTURE OF THE OYSTER INDUSTRY OF GEORGIA.

BY A. OEMLER, M. D.

We have but one species of oyster (*Ostrea virginiana*) on the coast of Georgia, but the shape and quality varies with the food and with the conditions which surround each individual. When found in large masses above ordinary low-water mark, bordering the marshes of rivers and creeks, it assumes the "coon" or "razor-blade" type, growing vertically, long, thin, and very sharp, like trees too crowded in a forest; a veritable illustration of a contest for the survival of the fittest. The usual width of these coon oyster ledges is from 8 to 10 feet, but the nearer to the sea we find them, or the greater the salinity of the water, the broader they become, reaching in some cases near the line of ordinary high water. As further consequences of the higher density, the oysters remain of poor quality later in the season, not improving in dry seasons until November, and spawning later than those situated in water of a lower degree, or approaching the standard of 1·0140, and better adapted to the American oyster, which is strictly a brackish-water mollusk. The density of the water over the ledges in the lower creeks and rivers in South Carolina ranges between 1·0214 and 1·0250.

Not being constantly submerged the deposit of mud on these coon oysters is slight, and that is removed by the action of sun and wind, hence they form clean collectors for an annually heavy set, producing a very crowded condition of living oysters with no room to grow laterally. When, however, a full set occurs on a planted, clean shell, the development is in all directions, the cluster sometimes breaking apart from the pressure of its own growth, and the shape and quality is better. Finally when a spat or two finds lodgment on a small object, or on a partially clean shell, we have the ideal single oyster to be enjoyed on the half shell. If oysters drop from these coon ledges near the sea into the stream below the line of low water, they usually perish, hence we find here no rocks or beds of oysters in mid rivers or creeks; but when this occurs from ledges not in so close proximity to the ocean, these "dropped off" oysters improve in form and quality, and here beds occur beyond the shore sustained by annual sets. The drill (*Urosalpinx cinerea*), the only enemy of the coon oyster in our waters, is found in these locations with greatest density, but not in such numbers as to account for the destruction. This difference in the life-history of specimens of the same species is evidently attributable to the difference in density, the American oyster not being able to survive and prosper in water of great salinity.

From my earliest childhood, I can remember the great abundance of oysters in Chatham County, and one of my earliest memories is, seeing my grandfather, a Revolutionary patriot, eating roasted oysters and sweet potatoes at my present home on Wilmington Island. With the exception of ten years in Germany, I have resided

here, off and on, for sixty years, and constantly for the past twenty-seven years, near to what were formerly the finest and most productive oyster-grounds in the State of Georgia, and have been able to observe their rapid exhaustion, and thus have feared their impending total extinction through improvident fishing. Fifty years ago, when the city of Savannah had a population of about 13,000, and there was no outside demand, the market was readily supplied, without any necessity to resort to tongs or any other implement, and even when ten years later shipments into the interior began to be made, they were rarely employed.

The shores of the larger creeks, and of the rivers in favorable locations above low-water mark in Chatham and Bryan counties, were lined with "coon oysters," which supplied the stock for opened or shucked oysters. The bottoms of high-water creeks, or such as went dry or nearly so, under favorable circumstances were more or less covered with single oysters, which were gathered by "picking." Sometimes the finest specimens were procured by hand, about a foot deep. This method required no culling, and had the great advantage of involving no disturbance of the empty shells.

Population having increased and the demand having become greater the beds both above and below low-water mark had commenced to deteriorate, when the enforced rest during the period of the civil war restored them to a greater degree of productiveness. The period of most rapid depletion of the grounds of Chatham and Bryan counties, which had formerly supplied the trade of Savannah, is therefore embraced within the last twenty-seven years. Three years ago all the ledges and banks of coon oysters, other than those at private landings, being in sight and easy of access, had completely disappeared, and the natural beds below low-water mark had decreased in productiveness fully 87½ per cent. The culls of tonged oysters are now used for opening, and for the several years past the trade has had to be supplied from the southern counties and from the less-ravaged beds in South Carolina. In 1886 my sons shipped 1,546 barrels of shell oysters to Philadelphia, but during the next season they were only able to procure 881 barrels with nearly double the number of tongers. About ten years ago I applied to the agent of the Ocean Steamship Company for space in the ship's ice box to send a 2-gallon can of opened oysters as an experiment to New York. He replied it was like sending coals to Newcastle; but since then the trade has greatly increased; a single party who visits Savannah every season for the purpose ships about 13,000 gallons, mostly to Boston, Mass. He has never been able to procure more than half the quantity wanted during the months of November, December, January, and February, and the supply has been decreasing annually.

Ensign Drake, in Bulletin No. 19 of the Coast and Geodetic Survey, estimates the total area of the public oyster beds at 1,700 acres, and even if he had included the few exhausted beds, which he intentionally omitted in his delineations, it would still be inconsiderable. According to the somewhat incomplete survey, South Carolina has 773 acres, nearly exclusively coon oysters. Lieut. Francis Winslow reports 10,165 acres in North Carolina, and the oyster commission of Maryland, in their report of 1884, quote 123,520 acres in that State. To have maintained our beds in any satisfactory state of productiveness as public oyster beds, would have required the exercise of a high degree of intelligence and the most vigilant care from the start, instead of which they have been constantly ravaged by the most outrageous improvidence of their privileged destroyers, and but for the fact of usually an annual set in our climate, they would have been exterminated in a much shorter period.

The colored oystermen (there is not a single white man now engaged in the precarious occupation of tonging oysters in Chatham County, although a few had assisted in the process of depletion) fill their boats during the last quarter of the ebb tide and the first quarter of the flood, indiscriminately with oysters, loose shells, and other débris of the beds, and while drifting homewards they cull their loads. All the young oysters, of the most recent set, and all the empty shells, so indispensable as collectors to replenish the beds, are thrown overboard to be engulfed in the soft mud of the river bottom, or when the culling process has not been completed in transit, they are as effectually destroyed by being cast upon the shell heap at home. Thus, the oyster beds are bodily removed; the elevations, which had prevented the deposit of silt, are reduced to the general level, and an area which might give employment and sustenance to their descendants vanishes forever as a source of food for the public.

That community or State enjoys the greatest degree of prosperity which encourages private enterprise, enhances production, and increases its exports; hence any treatment of the natural oyster beds (belonging to no class of individuals, but to the people at large of the State) which could restore them to their former condition or would increase their yield a thousandfold could not fail to give more employment to labor and promote the public welfare.

Being an eye-witness to the rapid march of our beds to the usual fate of extermination; believing in the correctness of the Malthusian theory that the population increases in a geometrical ratio while the production of food can only increase in an arithmetical ratio, when all the arable land is cultivated and when all other sources of food are developed by the application of intelligence and enterprise; and desiring to provide every oysterman with an oyster farm of his own, upon which he could at least save his enormous waste for future use, I commenced an agitation in 1887 for a more enlightened, more progressive, and more protective oyster law. The old law of 1876 only restricted the oystermen to the use of the tongs previously in common use, and secured riparian rights and the privilege of planting oysters opposite their habitable highlands to the land-owners to the distance of 120 feet below low-water mark.

In order to inform the people of the merits of the case, I addressed several communications to the public through the medium of the daily press and delivered a lecture on the "Life-history, propagation, and protection of the American oyster" at the two monthly meetings of March and April, 1889, of the Georgia Historical Society. Subsequently a printed copy was distributed to each member of the two houses of the Georgia legislature, at the sessions of 1889 and 1891. As usual with every reform, I encountered violent opposition. The dealers in Savannah were the principal opponents. The public were informed that the clause providing for a close season was an interference with a free trade in oysters. I quote from one of the contributions:

> The returning of the shells to the banks is rather a ridiculous and uncanny undertaking, as there are always enough shells left there to furnish resting-places for all the loose spawn that may be floating around, and, besides, it is not an uncommon thing for it to take root in the mud, which the doctor claims is such a merciless enemy to the young oyster. The oysters do not need any protection; there are thousands of beds on the Georgia coast that have never been molested, and thousands of beds being formed every year.

Whereas, in fact, we have not a single record of the formation of a natural bed, and know that a whole century is not a sufficient period. One legislator from the coast stated if my bill became a law the governor would be compelled to call out the militia to suppress riot among the oystermen. However, after being amended, it

passed the house without a dissenting vote, and was signed by Governor Gordon in September, 1889. The most important feature of my bill, which failed of passage, provided for a salaried oyster inspector for each three of the six coast counties. No game, fish, or oyster law can ever be properly enforced without such a responsible officer. One of their duties might have been the enforcement of the law for the protection of terrapin, which I had framed, advocated, and was instrumental in getting previously passed some years before by the Georgia legislature. The appointment of these officers would have obviated subsequent litigation by supplying a very effective witness in every case of oyster piracy, and would have been a valuable aid to the county commissioners when called upon to grant leases in strict conformity to the law.

The legislature provided, at the same time, principally at the instance of the opposition, but in accordance with the desires of the friends of the oyster industry, for the appointment of three oyster commissioners for the purpose of investigating what further legislation should be recommended at the next ensuing session to perfect the law, and Governor Gordon appointed J. L. Warren of Savannah, R. W. Grubb of Darien, and James Postell of Brunswick. After an interview with Governor Gordon I wrote a resolution, which was presented by Hon. James Postell to the legislature and passed, and then, upon application to the U. S. Government by the governor for the purpose, Ensign J. C. Drake, the most available expert, was detailed to make a survey of the oyster grounds and waters of Georgia. His report was issued as Bulletin No. 19 of the Coast and Geodetic Survey.

The most important features of the law were: (1) A close time from May 1 to September 1; (2) the culling of oysters over the beds; (3) the carrying of lights in boats employed in tonging at night; (4) the leasing by the county commissioners of 5 acres, and no more, at $1 per acre, for the term of twenty years, within 1,000 feet from shore, not to extend beyond the center of the stream, and the ground was not to have been previously resorted to by the public to procure oysters for consumption or sale, and these leases were not transferable; (5) the leasing on similar terms and restrictions of 500 acres in mid-stream, or beyond 1,000 feet from either shore. No lessee could take up ground within 120 feet from low-water mark opposite habitable highlands. The rental in all cases went into the school fund, and the land had to be returned for taxation.

Under the provisions and protection of this law, four oyster companies, three with canning outfits and each with considerable capital, were promptly organized. Each of the three employed nearly as much labor as Ernest Ingersoll reported in the Tenth Census of 1880, the entire number of the planters, tongers, and wholesale dealers engaged in the industry of the State being 300 and the estimate of the value of all the shore property being $5,000.

In Chatham County the Oemler Oyster Company took up 357 acres in Wilmington River beyond the 1,000-foot limit and secured 300 acres in 5-acre lots. These latter being nearly all opposite the habitable highland of Wilmington Island, were not nearer than 120 feet from ordinary low-water mark. Private oystermen, white and colored, took up about all the bare bottom in shallow water fit for oyster-culture, not aggregating 100 acres. Larger areas were taken up in Glynn and in Camden counties.

When Ensign Drake first appeared with the U. S. schooner *Ready* in our waters he had several native oystermen to locate on his chart all the natural beds known to them, whether depleted or otherwise, and I do not believe a single one was overlooked in Chatham County, not as an aid merely in his work, but in order to learn what were claimed by the people as public oyster beds. During the progress of his survey he

found areas so claimed, and to my own knowledge so indicated, to be virtually valueless as public beds, and, therefore, omitted them in his delineations, believing they would become of more benefit to the public if taken up, cultivated, and made productive. In his report he refers to two such cases specifically, as follows:

A few natural beds were found in this river (Wilmington) principally between Thunderbolt and Turner Creek, but they are of no consequence, having been about exterminated by excessive fishing, being so near the oyster market. * * * Very few oysters are now found in Oyster Creek, but they are of fine quality. There are a few scattered oysters and dead shells over the upper half of the creek, but they have not been considered thick enough to be indicated on the chart.

Now, although such territory was not subject to lease under the law of 1889 and very well known to have been natural beds, leases were granted here in violation of the law, and in the lower counties large areas were leased, actually indicated on the charts of Bulletin No. 19 as natural beds. In cases before the courts for trespass, the defendants and their witnesses might swear, and have sworn, that barren ground which had been leased and cultivated by a colored man had been a natural bed, and negative facts are difficult of proof. In one such case I had myself prepared the application for a colored oysterman (gratuitously) and made affidavit before the county commissioners about the barrenness of the bottom. In order to prevent further encroachments on the productive grounds, so necessary for a public supply, at least until the leaseholds could become productive; in order to supply absolute proof of the presence, under the law, of a public bed, and thus to diminish or prevent litigation and piracy, and, also, in order to increase the very small area fit for oyster-culture in shallow water, the oyster commissioners recommended that Bulletin No. 19 should be legalized as conclusive evidence of the location of the natural beds, all vacant grounds on the charts to be leasable. This now met the views of the two largest country dealers, who each own several sloops and schooners for the gathering of oysters for the city trade, who have more capital invested than the city dealers and who desired to become oyster-cultivators.

The other most important features recommended by the commissioners were the transfer of leases, and that lessees of 500 acres should be permitted to supplement their areas by inshore territory when they were unable to find the full acreage in mid-stream. A bill was prepared by myself in strict conformity with the recommendations of the commissioners, and it passed both houses of the legislature without opposition. An attempt was made to induce the governor to withhold his signature, and subsequently to amend the law and make Bulletin No. 19 only prima-facie evidence, but both fortunately failed. In reference to the mode, policy, or benefits of preserving the exhausted beds for the support of future generations, Prof. W. K. Brooks, our greatest authority upon the oyster, wrote me:

The only way I see to restore and maintain exhausted beds is by cultivation, for, even if a few of them should recover under natural conditions, they would again be destroyed as soon as they are opened again to the public.

Ensign Drake, in a letter from Yokohama, Japan, November 16, 1891, wrote:

For the good of the State and its *useful* citizens I would have curtailed the delineations of the natural beds far more than in Bulletin No. 19, had I known that the legislature might adopt the report as legal evidence of public oyster-grounds.

In Bulletin No. 19 Ensign Drake says of Wilmington River:

It is believed that oysters can be grown successfully in the major portion of this river, especially in the deep and harder bottom from Turner's Rocks to the mouth.

Mr. H. J. Lewis, an extensive and experienced oyster-culturist of New Haven, Conn., and president of the Oyster Cultivation and Canning Company, of Brunswick, Ga., dredged this river carefully with a view to taking it up, actually began negotiations to that end, and pronounced it the best river in Georgia. Its depth of from 20 to 35 feet was not considered objectionable, in view of the fact that some of the best grounds in Long Island Sound have 14 fathoms over them.

In March, 1890, the Oemler Oyster Company planted 11,520 bushels of oysters on the upper end of its territory in deepest water of midstream, which the expert, Ensign Drake, had pronounced the most promising; and partly along shore in close proximity, and partly near the middle of the river, the depth ranging from 20 to 35 feet, it put down in May 18,500 bushels of shells. On the shore area spawners were distributed with the shells. At the first examination the oysters were found to be perishing, and in a few months hardly a living specimen could be discovered, yet not a starfish nor drill had appeared, nor did the oysters suffer for food.

The company then discarded all its midstream grounds, but planted, between November, 1890, and April, 1891, 111,158 bushels within the 1,000-feet limit, opposite Wilmington Island and opposite and below Skidaway Island, a portion being virtually over 2 miles from any habitable highland. These were examined several times and always seemed promising. When they had been down about sixteen months 400 bushels were dredged up in the presence of the directors, myself being one of them, from different portions of the ground for the purpose of determining whether we would utilize them at once for canning or not. They seemed to be still prosperous and came up perfectly free from silt; in fact all the oysters on the lower surface of large heavy bunches, upon which they had rested, were as sound as any, indicative of a very hard bottom, free of silt or sand. The superintendent of the company wished to use some of them, but the board unanimously voted they should remain longer for the anticipated improvement in growth and condition, and in the meantime we would depend upon other sources. Two very small starfish were found on this occasion near the lowest part of the ground. When, eight months later, we proceeded to dredge them, so many had perished that the entire planting of 123,500 bushels had to be considered a total loss, as it would not pay to take up the survivors with the much greater mass of dead oysters. Thus, instead of an increase of at least 50 per cent in two years, or about 200,000 bushels, the company got virtually nothing. Full-grown starfish were now found, but still exclusively on the lowest end of the territory, and their presence could not account for the death of the oysters.

On the other hand, the company planted 55,311 bushels of oysters in the spring of 1892, and 16,500 bushels of shells in May, 1892, on a part of its 180 acres in the shallower and fresher waters of Oyster Creek, the latter being about and above low-water mark. The depth of the creek nowhere exceeds 15 feet. The shells put down here, and elswhere, in shallow water in 1891 and 1892, of high or low density, secured an astonishing set, and if left undisturbed would have supplied nuclei for coon-oyster ledges in both densities alike. When recently examined the oysters seemed in a prosperous condition. At the time the first shells were deposited I was aware of the failure at Brunswick, the year previous, to secure a set in deep water, and subsequently learned that the absence of a set in the deep waters of the south was being investigated by the U. S. Fish Commission. My opinion, therefore, is that the deficient set, the death of the spat, and the destruction of mature oysters in Wilmington River, at

Brunswick and elsewhere, is attributable to the salinity of the water, and that the American oyster can not endure constant submersion in water of great density at the South, and that the mere specific gravity does not affect the set. The theories advanced explaining the absence of a set in deep water at the South are as follows:

1. The extreme density of the water preventing the swimming embryos from sinking at the fixative stage.

2. The extreme softness and film-covered character of the bottom preventing the oyster from fixing.

3. The suspension of slowly depositing silt in the deeper water, whose clogging action is fatal to the delicate respiration of the microscopic young.

4. Changes in the composition of the oyster-bed water, either in its salts or food constituents, at different levels.

Dr. Bashford Dean remarks in "The Physical and Biological Characteristics of the Natural Oyster Grounds of South Carolina" that "if the first theory be correct, spat in no instance should be found in deep water of high specific gravity," and that "spat has been sparingly found affixed to deep-water shells, but we must admit that it may have been attached before the host itself dropped into deeper water."

When the shells we had planted in water not anywhere less than 20 feet deep were examined, a slight set had undoubtedly occurred, and but for the exceedingly warm winter and early spring, which induced the mother oysters to emit their spawn very early, it would have been heavier. In fact, we first attributed our failure entirely to this fact. But in every instance the young oysters, all less than one-eighth of an inch in diameter, were dead. The upper shells were intact, but could be brushed off by the slightest touch. Previous fixation could not have occurred in our case, for all the shells were 8 or 10 years old, and time and rough handling must have removed all such young oysters before the shells were deposited. If a set occurs at the North in consequence merely of the ability of the spawn to sink at its fixative stage, and does not do so at the South in water of exactly the same specific gravity, then the inevitable conclusion follows that the spawn of all northern oysters is heavier than that of all southern oysters of the same species.

Dr. Dean also says that as the water becomes fresher the oysters, with spat of undeniably recent attachment, as in the North, should be found in favorable localities covering the bottom; and, accordingly, as the water becomes less salt the raccoon ledges should gradually and entirely disappear. He says:

> This does not maintain. Notwithstanding the water becomes fresher in character, deep beds of single oysters do not become common in an increasing ratio. Such as are found rarely have spat attached, and in every way appear still to represent the dropped-off raccoons. As the water becomes less dense raccoon ledges do not disappear. Oyster ledges occur in Winyaw Bay, where the specific gravity of the water is as low as 1·010.

Now, as has been stated, coon oysters dropped from the ledges and constantly submerged in water of high density perish, and while there does not seem to be any reason why coon ledges should not be able to form in water of low density under favorable circumstances of freedom from silt and the presence of collectors on the shore, the fact is undeniable that they do generally diminish as the water becomes fresher in rivers receiving a large amount of fresh water, and that the oysters improve in quality as the density declines. This obtains in the rivers of Georgia, and natural beds independent of coon reinforcement have remained self-sustaining in the fresher

waters from generation to generation for centuries. This fact is perhaps more evident in Chatham County, receiving the waters of the Savannah and Ogeechee rivers, than elsewhere. Of the 384·7 acres surveyed and reported by Ensign Drake as natural beds in Chatham County, nearly all are below low-water mark, and there are no ledges now, nor have there been for years, to supply the spawn or the dropped-off oysters.

Ensign Drake indicated the location of a natural bed in the upper part of Tybee River, reaching from shore to shore, where it is 320 yards wide, and the nearest coon oysters are on a small bed at my landing, about 1½ miles below in Shads River. The only oysters in the main channel of Savannah River are about 80 acres of natural beds at its mouth, 900 yards from shore, and now being destroyed by the harbor improvements, with no coon oysters in the vicinity. The lowest density at the mouth at low water was 1·0090, and the mean of 29 observations at intervals of 4 hours was 1·0146, about the standard density.

That the set is not now more abundant on the old oysters and dead shells of the natural beds of Chatham County is attributable to the fact of their exhaustion and of their uncleanliness. The normal shape of these single oysters of all ages and sizes on the natural beds precludes the idea of coon origin. The river in South Carolina which best illustrates the effect of fresh water upon the life of the oyster and best proves the facts I have enumerated, is New River. It not only receives fresh water from the Savannah River through Walls Cut, but it drains Great Swamp and during every freshet the Savannah overflows into it through Great Swamp.

Mr. John D. Battle, in his survey of the coast waters of South Carolina, reports:

> The only raccoon oysters observed along the shores of New River are found between Ramshorn Creek and the mouth of the river, in narrow patches, about 10 feet wide, of dead shells and living oysters, the former largely in excess, due in a manner to overfishing in this limited area.

Had the survey extended higher up the river than Ramshorn they would have found some extensive, self-sustaining natural beds of single oysters in Tea Kettle Creek in a depth of 14 to 20 feet, about 4 miles above these ledges, and there are no coon oysters above Ramshorn. These beds supplied a part of the stock for the "Colossus Brand," put up last year by the Oemler Oyster Company, and a company located at Beaufort, S. C., had previously also used a steam dredge upon them extensively.

The Oemler Oyster Company planted 18,300 bushels of oysters in Wilmington River below Skidaway Island. Four months previously it had planted 38,496 bushels 2½ miles above this point in water of the same depth. Five miles still higher up, at Thunderbolt, is, according to Ensign Drake, the upper limit of ground fit for oyster-culture, on account of decreasing density, but here oysters, having grown naturally, are now successfully cultivated in a depth of 20 feet and over. The destruction of the oysters of the Oemler Oyster Company has increased with the increase of density over the grounds, notwithstanding the lowest were put down 4 months later.

In regard to the effect of floating and deposited silt, I will merely remark that it is greatest in the fresher waters. The water is purer near the sea, and, in consequence of the greater velocity of the current, the deposit is slighter. Exceptional cases of a set and of a bed below low water may and do occur near the sea in water generally of high density. Sometimes such a bed succumbs to adverse influences, after a few years' existence, to become rehabilitated under a phenomenal influx of fresh water.

The only case in Georgia of an oyster reef extending into the ocean occurs off the northeast point of Little St. Simon Island, where Ensign Drake found the density

at low water to be 1·0067. At one-half flood tide it was 1·0124 at the surface, while at the bottom it was 1·0214. Three full-grown starfish were dredged up. One of them, placed in the surface water, died in twenty-four hours.

We know that attempts have been made to introduce the American oyster in France, and while it survives but will not spawn at Arcachon, in a density of 1·023, it perishes in the general density of the French coast of 1·026, the difference being only 0·003. Dr. Bashford Dean says:

> In the southern oyster the greater saltness of the water is at once apparent in the richness of many forms of food regarded as exclusivly marine, as *Triceratium favus* and several *Triceratia*, apparently undescribed, that I have seen in the Caribbean Sea. The lack of brackish-water diatoms affords a marked contrast to the Long Island forms.

It appears from the report of the North Carolina survey, by Lieut. Francis Winslow, that no oysters were found in the deep-water sections.

We know the density increases with the depth. Ensign Drake reported the surface density at the mouth of Wilmington River at 1·0271, which is in excess of the density fatal in France, and it was probably still greater at 20 to 35 feet deep, a little higher up the river, after the two seasons of excessive drought which had succeeded the planting and during which the river could have brought down only a small quantity of fresh water. Large lakes in Florida and Georgia had gone dry, as, for instance, Lake Newman, or Paine's Prairie, 68,000 acres; and Lake Miccosukee, 9,999 acres. I took out of the basin of the latter, about 3 acres in extent (at one spot 65 feet deep), with one seine, in four days, 123 barrels of terrapin, and 6 barrels with the first haul. All the trout had perished as soon as the water became stagnant. They had been so abundant that the dried carcasses still lined the shore. Buzzards had not been numerous enough to devour them, although I counted 91 on an area not more than an eighth of an acre. The shores of the lake had been pleasure-grounds for fishing parties from the neighboring counties of Georgia and Florida, and the lake had supplied the population with fresh fish; yet the neighboring farmers were congratulating themselves upon the destruction of the trout, because they had afforded a precarious support to and demoralized their labor. Whatever be the cause, the fact remains, that the deep waters of Georgia within or beyond the 1,000 feet limit must be excluded from ground heretofore held fit for oyster-culture, and it emphasizes the value of the last law, which slightly increased the actually valuable area subject to lease, especially in Chatham County. Without that accession Chatham County would have to rely, at no distant day, upon the cultivated crops from less than 100 acres to supply the population of Savannah (now over 50,000) and its entire oyster trade.

Ensign Drake estimated the entire area of the State fit for oyster-culture at 30,000 acres, of which 6,000 is outside and 24,000 inside the 1,000 feet limit, and of this latter the Oemler Oyster Company have demonstrated the unfitness of about 500 acres in Chatham County alone, and that of the entire 6,000 acres of the State in mid-stream.

When the oyster-canning companies went into operation they anticipated the temporary use only of the inferior coon oysters until they should be able to avail themselves of the product of their non-cultivated grounds, but the disastrous experience here and at Brunswick has shown that such companies can not become self-sustaining, because they now lack the territory on which to grow a better quality of stock than the native coon oysters. The best of these are not satisfactory and yield

such a small quantity of meat to the bushel that, under the present low prices of canned oysters it will not pay to procure them from distant points for the purpose.

What the success of oyster-culture on an extensive scale might have been in Chatham County under more propitious circumstances, and may yet become if suitable grounds can be secured, has been foreshadowed by the fact that one of the most extensive and justly-renowned packing companies of the United States paid the Oemler Oyster Company, in Baltimore, an extra price for the oysters we were able to put up of our own cultivation, with the privilege of using their own labels.

In his "general conclusions" Ensign Drake, with the lights then before him, properly and wisely observed:

> As a means of rapidly depleting the natural beds no more effective method could be instituted than the establishment of factories for the canning of oysters. These in the end will be of great benefit to the State, because the sooner the natural beds are depleted the sooner will the citizens engage in private cultivation and enact laws that will give inducement to capital.

At that time, however, neither he nor anybody else had any prevision that a very large portion of the area held fit for oyster-culture would be demonstrated to be useless for the purpose, and that capital would be wasted in its attempted development.

The aggregate area taken up in Chatham, Glynn, and Camden counties under the last two laws is 8,228 acres; hence $8,228 have gone into the school fund and 8,228 acres of previously useless territory have been entered for taxation. Of the 5-acre leases in Chatham County, 67 are held by white and 44 by colored people, aggregating 555 acres. Under the wonderful fecundity of the oyster and the usual certainty of an annual set, this territory could, under favorable circumstances, doubtless be made exceedingly productive.

While the present acreage fit for oyster-culture in the waters of Georgia is very small in extent, that of the marsh lands, which may be readily excavated for pond culture, is very great. At a rough estimate, there are 35,000 acres in Chatham County, belonging, under an old grant of the State, to the two educational institutions—the Chatham Academy and the Union Society, with its orphan asylum at Bethesda, founded by John Wesley. The demand having already exceeded the supply before the exhaustion of the natural beds had reached its present state, the cultivation of oysters being only successful in shallow water and the quality of such stock being of superior grade, the future hope of any extensive oyster-culture in Georgia seems to lie in these marsh lands.