THE CLAM PROBLEM AND CLAM CULTURE.

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At the present day the public seems to recognize quite fully the value of the work of our fish commissions—State and national. They know that through the artificial rearing of young shad from the egg the United States Fish Commission has saved our shad industry on the Atlantic coast from inevitable ruin. They have also seen the direct benefit, in thousands of instances, of the stocking of inland streams and lakes with fish which have been hatched and cared for until they were old and strong enough to care for themselves. There does not, however, seem to be so general an appreciation of the fact that the shellfish—the oysters, clams, and scallops—of our eastern coast also need to be very carefully conserved in the immediate future. For some years past there has been considerable study and discussion of the artificial methods of oyster propagation, and in some of the North Atlantic States, especially Rhode Island and Connecticut, "oyster farming" has been the means of saving the industry. But the oyster question is not yet solved, and much remains to be done in the development of new methods of artificial propagation, if the supply is to meet the increased demands of the future. The appropriations for State and national commissions are much too small to allow extended investigations along these lines, though public money could probably not be expended with better results to the whole people than in this way.

Quite unexpectedly we are confronted with a new problem. Over the greater part of the New England coast the supply of clams has suddenly diminished to an extent which has become alarming. Extensive areas which four or five years ago produced great numbers of clams are now practically barren. The explanation is simply that the demand has increased at such a rate that too large a number of the natural "seed" clams have been removed, and extinction suddenly follows. The beds should recover themselves quickly, but one man, in wandering day after day over an area of many acres thus impoverished, is easily able, by digging up the few large clams which he may find here and there, to absolutely prevent the possibility of establishing a new supply. Not only are the larger clams now sought for, but in some localities those which will measure little more than *one inch* in length are dug up and sent to market. The demand is increasing and prices are rising.* When a certain locality is exhausted, the amount taken from others still productive is conse-

* Large clams sell in the Fulton market for 6 cents apiece.

quently much greater. We may thus understand why the calamity—for such it really is—has suddenly fallen.

In certain localities, of course, this exhaustion of the clam beds took place many years ago, and it is interesting to notice that, for the reasons given above, they have ever since remained practically barren. The history of one of these regions demands especial attention, being particularly instructive at present, because a considerable effort has been made there to reclaim the barren flats.

At the mouth of the Essex River, just north of Gloucester, Mass., are some very extensive flats, upon which immense numbers of clams were formerly found. Several years ago these flats were rendered practically unproductive through excessive digging, and have remained so until the present time. About ten years ago the only serious experiment at clam culture of which we have any record in this country was attempted here. It proved to be a failure, and yet the reasons for the failure are easily found, and the fact is demonstrated that the methods employed would have been entirely successful if the experimenters had been protected from outsiders and from each other.

In the report of the United States Commissioner of Fish and Fisheries for 1894 we find the following reference to the Essex experiment, quoted from Mr. Ansley Hall:

> I found quite an interesting feature in connection with the clam fisheries at Essex, Mass., in the shape of clam culture. In 1888 an act was passed by the legislature authorizing the selectmen of the town to stake off, in lots of 1 acre or less, each of the flats along the Essex River, and let them to persons desiring to plant clams, for a rental of $2 per acre or lot for five years and an additional fee of 50 cents. Thus far 37½ acres have been taken up and seeded with clams. Small clams are dug on the natural beds and planted on these hitherto unproductive flats. Mr. J. Bennett Fuller states that about 500 bushels are required to plant an acre properly. During the first two years (1889 and 1890) the people were slow to avail themselves of the privilege of planting for fear that after they had spent their time and labor they would not be able to secure protection from trespassers. But in 1891 and 1892 lots were obtained and planted. The principal difficulty encountered has been the loss of clams by the sand washing over them, the bottom in some localities being soft and shifting. In 1892 there were 25 acres that were quite productive, about one-third of the entire catch of the section being obtained from them. The catch from these lots is not definitely known, but is estimated at about 2,500 barrels.
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> The cultivated clams possess some advantage over the natural growth from the fact that they are more uniform in size and are as large as the best of the natural clams. They bring $1.75 per barrel, while the natural clams sell for $1.50 per barrel. This is the price received by the catchers. One acre of these clams is considered to be worth $1,000, if well seeded and favorably located so as not to be in danger of being submerged with sand. This valuation would be too high for an average, since all the acres are not equally well seeded and located. The clammers are generally impressed that the industry can be extensively and profitably developed, and their only fear is that they will not be able to secure lots permanently. The greater part of the land available for this purpose is covered by the deeds of people owning farms along the river, and the consent of the land-owners has to be obtained before lots can be taken up. It seems probable, however, that the business will continue to progress unless checked by complications that may arise relative to the occupancy of the grounds.

This report is in the main correct, but there are some points in which it seems to be in error. Perhaps its author in stating that the flats were previously unproductive did not mean that they had always been so. The testimony of the older inhabitants is that at one time most of the flats, and the river banks back to the town of Essex, were covered with clams.

Another statement is that many planted clams were lost by shifting sand. In one or two instances trouble of this kind occurred on some of the river clam banks, but it was very insignificant, considering the total area seeded. For the last two

years at least, so far as I am able to determine, there has been very little change in the contour of the flats. There has been some shifting of sand and extension of the thatch plants, but these changes have been relatively unimportant.

Very much less than the estimated 500 bushels were put upon an acre of ground, and the clammers generally believe that half of that amount would be sufficient. As a matter of fact, few of the areas leased were properly planted, and for this and other reasons all estimates of the amounts which should be obtained as a result of planting under the most favorable circumstances are of little value.

As stated in the report, the cultivated clam rapidly became large and uniform in size, and hence had a high market value.

We have much evidence that the clam industry in Essex has in the past been extensive. From a curious little volume, which was published in 1868 by a local clergyman, on the "History of the Town of Essex from 1634 to 1868," I find the following paragraph:

> For the last twenty years * about 50 men and boys have been employed, chiefly in the spring and fall, in digging clams for fishing bait. For this purpose the clam flats in each town (Essex and Ipswich) are, by law, free to all its residents, and to no others. Five bushels of clams in the shell, it is usually reckoned, make one bushel of "meats"; about 2½ bushels of the latter are put into each barrel, and this quantity an able-bodied man can dig in three tides. One bushel of dry salt is used for each barrel. During this period of twenty years about 2,000 barrels of clams have been dug yearly, on the average, and sold at an average price of $6 per barrel. Deducting the cost of the barrel, $1, and of the salt, 75 cents, the sum of $4.25 per barrel, or $8,500 per year, has been earned in this business. The bait has been marketed chiefly in Gloucester.

Mr. J. B. Fuller, an old resident of Essex, has this to say of the former industry:

> When I was a boy there were about 100 men who were making a business of digging clams in Essex, while to-day there are not 10 who get their whole living by it. In those days a man could make from $2 to $5 and some times $7 or $8 a day. Now they obtain from 50 cents to $1.50 per day, with just as many acres capable of bearing clams as formerly and with a much better market. The demand, also, is rapidly growing. Then, again, the amount of labor now necessary is only about two-thirds of that formerly required, for then clams usually had to be taken out of the shell, and now they are shipped as they are taken from the bed.

Much more testimony of a similar character may be had to show that the flats, once very productive, have almost entirely failed, and in spite of the effort made to reclaim them.

It is not difficult to determine the reasons for the failure of the culture experiment at Essex. The areas upon which clams were planted were those which were at the time unproductive. The beds still containing clams—the "town flats"—were free to any native of Essex. The one thing which was absolutely necessary to the success of any planter was that the clams on his leased ground should not be disturbed by other diggers. This protection was apparently not given in any case by the town authorities, and, as no person lived within sight of the majority of the beds, it was quite impossible for any man to guard his property much of the time.

As to what followed it is not easy to obtain definite testimony from the clammers themselves. Other citizens of the town, however, and some few clammers, intimate that most of the men began to take clams from any property but their own, and that

* Presumably dating from 1868.

in this way the full result of no man's labor in planting was ever realized. Others who did not make clam-digging a regular business, but only dug occasionally, are said to have had no respect for the rights of those who had leased property. It was said that at times when vessel builders and the shoe factory released employees, many of them, for lack of other occupation, turned their attention to clam digging, with the result that too many clams were at the time taken from the flats.

Another reason for the failure of the Essex experiment is that a number of short-sighted clammers began to fear, after the clams had been planted, that the production might suddenly become so great as to glut their market and, as a consequence, force prices down. Some few individuals, inspired by this fear, are reported to have said and to have done everything in their power to prevent the success of the experiment. In all cases, it is said, the selectmen of the town, who issued the leases, refused their aid in the prosecution of trespassers.

In spite of the fact, which had been demonstrated in the experiment, that when properly planted the clams grew much more rapidly and became much larger than on the natural beds, no applications for a renewal of the leases were made when the first ones expired. No change in the condition at Essex may be hoped for until there is some evidence that a law protecting the planter will be strictly enforced. With proper protection a great industry might, and probably would, be quickly established, not only in Essex, but in any region where clam flats are now unproductive because of excessive digging.

It would be comparatively easy to formulate plans which, if carried out in this region, should reclaim the Essex flats. No single method would, however, be acceptable to all who are interested in the clam industry, and we have reason for believing that the few dissatisfied might easily defeat the efforts of the majority. The whole problem, as shown in the history of the oyster industry in this country also, narrows itself down to the simple question of protection. The leasing of lands to individuals is the necessary first step, and when the town or State authorities are willing to protect the lessee, the problem will be solved. This plan of leasing to individuals would seem to be the best one. Much may be said positively in its favor. A strong negative argument we have also, when we consider that any other scheme must depend for its success upon the cooperation of all concerned for the common good. We might know that this would hardly be possible, even if we had not the history of past events on these flats to guide us.

Mentioning a few of those plans which do not consider the lease, the first is a closed season. If all digging could be prohibited for one or two years, many clams would come to maturity, the young would establish themselves, and the beds would once more become productive. Undoubtedly this recovery would be rapid. But it must be remembered that in this process the clams would probably crowd each other closely, as they have done on the few natural beds existing to-day, and a season or two of thorough digging and thinning out would be necessary before many clams reached a large size. This thinning process would not be immediately advantageous, on account of the small size of the clams, and hence would probably not be done at all.

Another plan, proposed by some of the clammers, is that every man who makes a business of digging clams be required by law to deliver and plant on barren flats, set aside for the purpose, a certain number of small clams in the months of April or May—this planted area to be protected for a season, and eventually extended until

all the barren flats are covered, all flats upon which clams had matured to become common property. The fatal objection to this, as well as to the closed season, is that every man's interest is bound up in that of his neighbor, and he would be constantly haunted with the fear of not realizing his full share of the profits. This would prompt him to make sure of his own, and the result would be the quick and certain defeat of the whole plan. These communistic schemes have been tried often in our country in recent years, and we are able to know from their almost universal failure that this would certainly fail. Besides, the difficulty of determining who were really engaged in the clam business—making it a means of livelihood—would be very great. How much work, in planting for the public, should be asked of the man who digs clams for market only occasionally? It would also be difficult to determine when the public work had been done.

The lease, with swift and certain enforcement of a law against trespassers, would at once establish a great industry where there is now only the prospect of continued desolation.

The flats at Essex afford an opportunity for producing an immense number of clams. Great tracts, with here and there a growth of thatch plants, are exposed at low tide. Down near the opening to the sea the sands shift to some extent, but in almost every other locality the changes are so slow and so slight that clams are not affected by them. A glance at the appended map will give some idea of the immense size of this tract. But the map itself shows only what are known as the south flats. Stretching in a northwesterly direction from the region about Choate Island is an area of flats which many of the clammers claim to be larger than the one shown in the map. Unfortunately I was not able, when I visited Essex in August of 1898, to go over this ground as I did the south flats, but I could see from Choate Island that it was extensive.

In constructing my map I have represented the natural beds—areas where clams can now be found—by stippling. The beds which were planted in the culture experiment are again almost entirely barren. Of course clams may be found here and there on these tracts, but they are few in number. The clams of the natural beds are generally too small to market, chiefly because they are so closely packed together. If the majority of such clams were removed for planting elsewhere the natural beds themselves would soon produce an abundance of large clams.

The most important feature shown by the map is the extent of nonproductive ground, where every natural condition is favorable for the growth of clams. These areas were formerly, as I have indicated, natural beds. They are represented by the oblique shading lines. Almost every foot of ground for hundreds of yards about the point where the Essex River widens out into the great flats, might and should be yielding great quantities of the finest of clams, and this without glutting the markets near at hand, which are now forced to obtain their small supply from the Maine coast. These barren beds extend far up the river toward the town and into the mouths of the numerous creeks emptying into it, some of which are indicated in the diagram. I have been told by old clammers that at one time the mouths of these creeks were stocked with fine clams, and that in the late fall and early spring they afforded good shelter from the wind for men engaged in digging. The thatch banks, represented by short lines and stipples, contain at present great numbers of clams. The tough roots of the thatch vegetation, however, prevent digging, except along the edges and where the plants are scattered.

The map represents the extensive clam flats at the mouths of the Essex and Castle Neck rivers within the townships of Essex, Ipswich, and Gloucester. To the north and west of Choate Island, and connected with this, is an area of beds nearly as extensive as those represented in the map.* The main features illustrated are—

1. The present extent of the "natural beds" (this was determined in August of 1898). These are represented by stippling. Though the beds appear to be extensive, the clams are in some places much scattered, and in others so densely packed as not to be able to grow. Very few marketable clams are taken from these beds.

2. The great areas—represented by oblique shading lines—where every natural condition is favorable for the growth of clams. These beds are and have been for years practically barren. At one time producing an immense harvest, they were reduced and have since been kept down by excessive digging. The flats planted in the culture experiment are those directly west of Conomo Point and along the river banks.

3. The thatch banks, submerged at high tide, which, on account of their tough roots, hold great numbers of clams safe from molestation. They probably produce great numbers of young, which under favorable conditions should replenish the losses, from judicious digging, of the entire area.

4. The extent of the flats as a whole, indicating how great an industry might be supported in this region.

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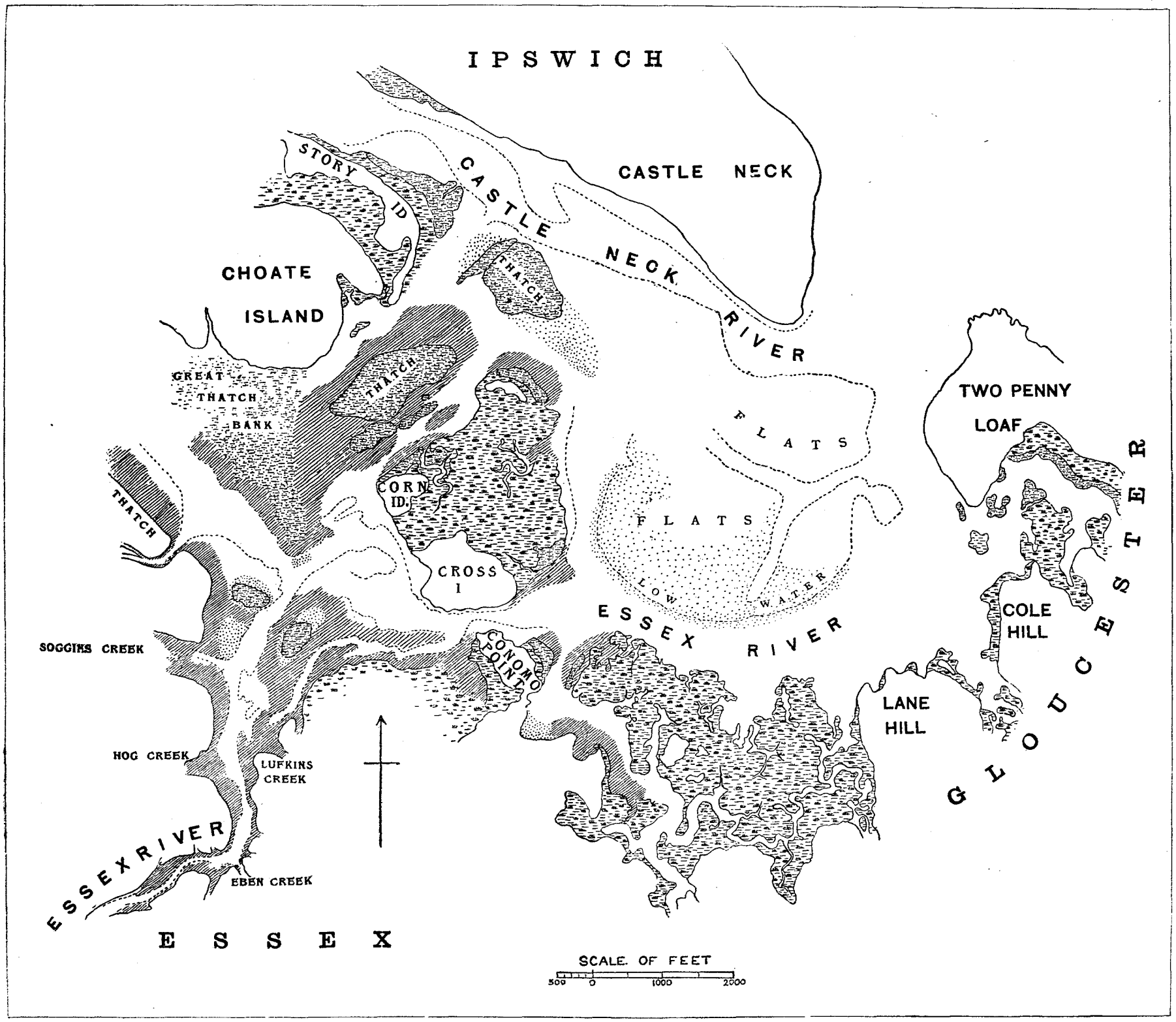
* While many kindly gave their assistance, I am especially indebted to Mr. J. B. Fuller and to Mr. E. Hobbs, of Essex, for their aid in collecting the data used in text and map.



MAP SHOWING CLAM FLATS AT MOUTHS OF ESSEX AND CASTLE NECK RIVERS, MASSACHUSETTS.