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AN ROINN TALMHAIOCHTA AGUS IASCAIGH  
(Department of Agriculture and Fisheries)

FISHERY LEAFLET NO. 10.

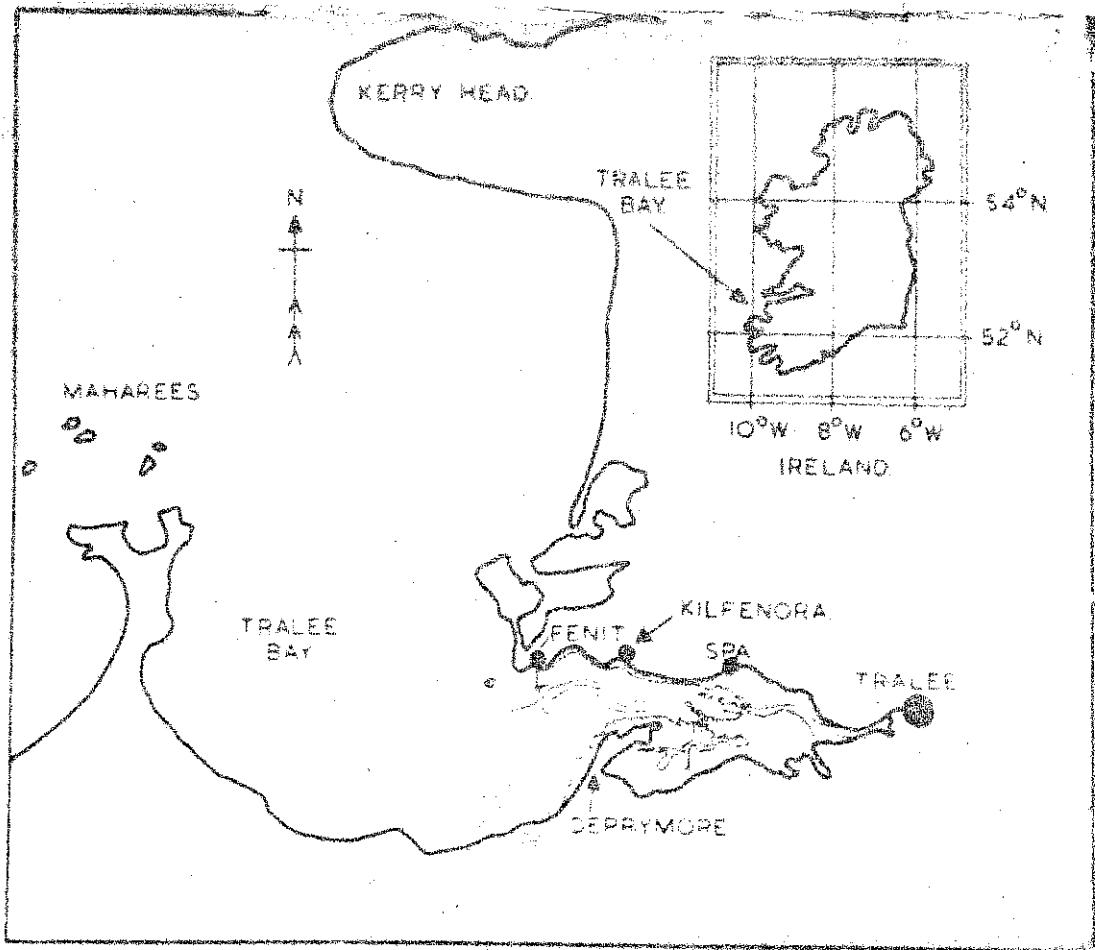
TRALEE BAY OYSTER INVESTIGATIONS (1965-1968).

by

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Map showing the location of Tralee Bay, Ireland.

## Investigations by the Department of

Agriculture and Fisheries into the Tralee Bay oyster beds first commenced in a small way in 1965. Since then, especially during the summer of 1968, a more intensive programme has been carried out involving the collection of spat (oyster young) and plankton samples, the study of currents and temperatures in relation to spat-fall (settlement) and, finally, test trials on various types of spat collectors.

Prior to spat-fall, which usually occurs from late June to late August, a number of concrete blocks each holding two unglazed plates (Fig.1) were put down in selected parts of the bay. One plate from each block was changed weekly and the oyster young or spat which had settled on it were counted. The other plate was allowed to remain until the autumn to enable the degree of growth and fouling to be observed. This work, which has been in progress for three years, has shown (a) the areas where spat settlement is heaviest; (b) the areas where spat growth and survival is greatest; (c) the areas where fouling by undesirable organisms is least; and (d) the time when settlement occurs. This information is needed to select the areas where shell cultch or other collectors can best be placed in order to increase spat-fall by providing suitable settlement surfaces for the larvae.

The area west of Fenit pier and that south-west of a line from the pier, through Curraglass Rocks and on to Derrymore, have been found to be unsuitable for spat collection. Settlement there is light, growth is poor and fouling is very heavy. On the other hand settlement and growth are good, with little fouling, on the main bed stretching from Kilfenora Station to Foley's Hole, being especially good around the latter place at the east end of the bed (Fig.2). However, the deep channel north of Derrymore has proved to have by far the heaviest settlement each year (Fig.2). In August, 1968, an exceptionally heavy settlement was recorded here, 748 spat settling on a 180 mm diameter plate in 9 days. In addition there was very little fouling and the growth of the spat was excellent. However, experiments with tagged oysters have shown that the survival and growth of adult oysters in the Derrymore area are not as good as on the main bed. Therefore, while this is an ideal area to catch spat, the spat should be removed to the main bed in order to achieve the maximum number of marketable oysters.

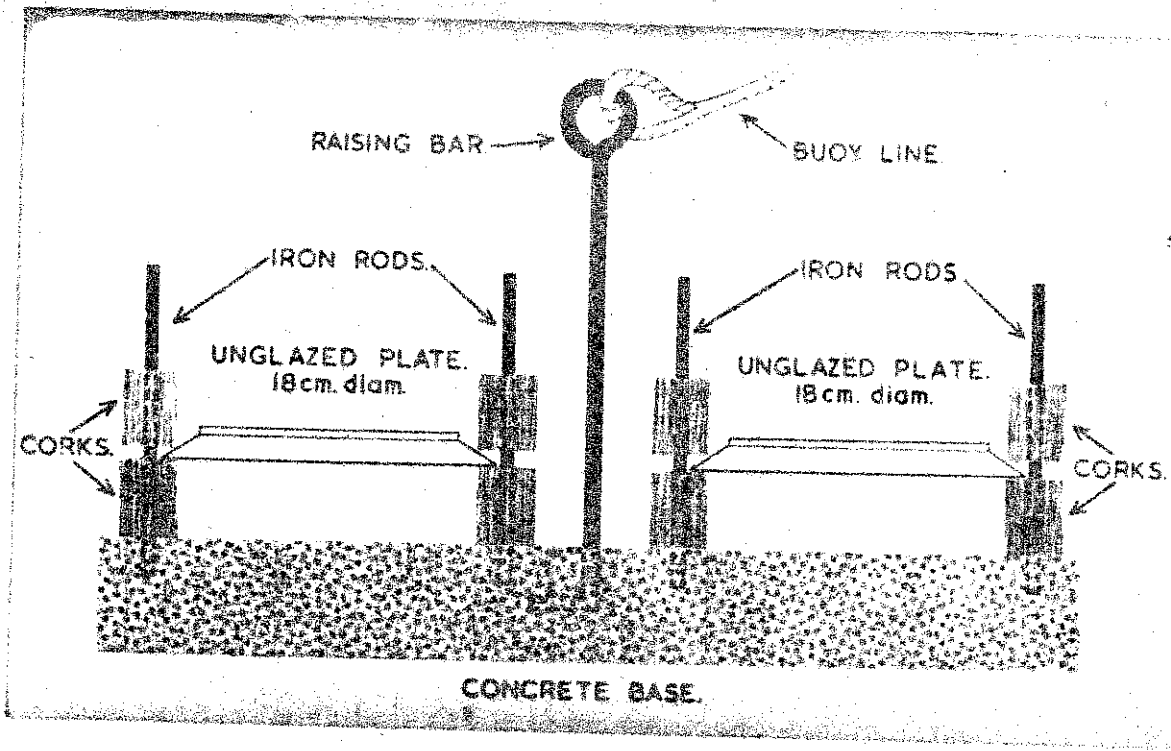


Fig. 1. Schematic cross-section through oyster-spat collector used in these experiments.

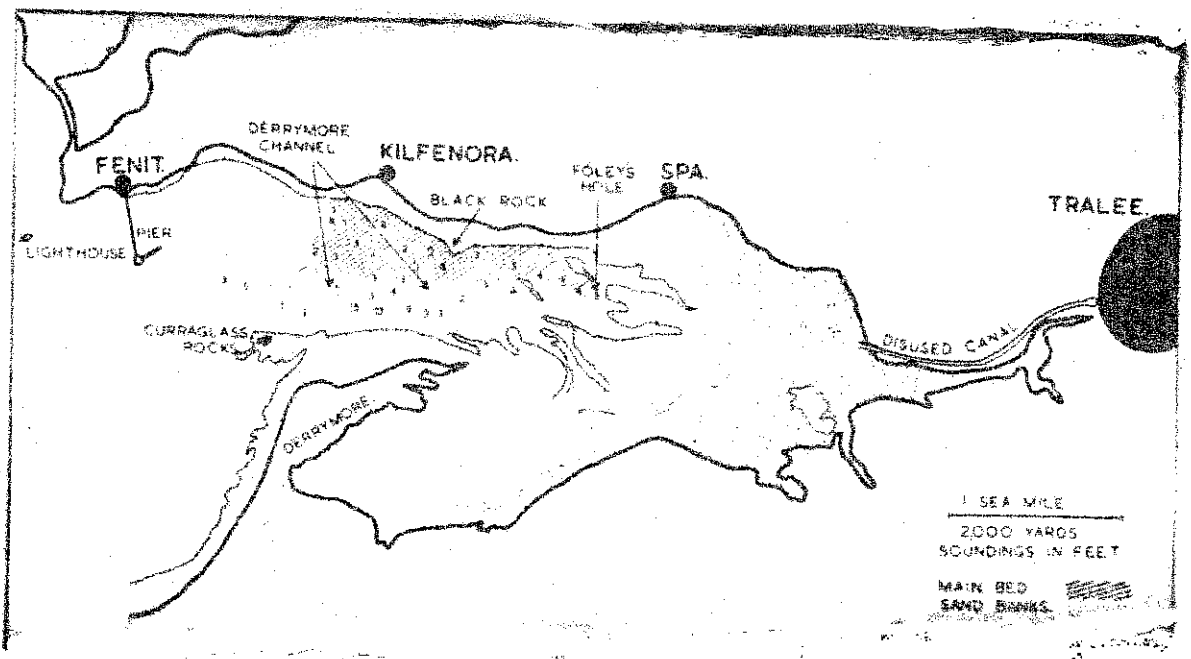


Fig. 2. The Tralee Bay oyster fishery showing depths at low water Spring Tides and particular parts of the oyster beds referred to in text. The Mean Spring Rise is  $12\frac{1}{2}$  ft, Neap Rise  $9\frac{1}{4}$  ft, Neap Range 6 ft.

Plankton samples of 100 litres (22 gallons) each were also taken frequently. An experiment in which samples were taken hourly from low water at Derrymore Channel and also from the centre of the main bed, off the Black Rock (Fig.2), showed that the number of oyster larvae per 100 litres at Derrymore rose rapidly as high water approached and reached a figure more than seven times as high as the concentration of larvae on the main bed, where the concentration remained fairly steady throughout the tidal flow (Fig.3). It was not possible on this occasion to take a sample at high water, but samples taken four days later showed that the concentration at Derrymore continued to rise for at least two hours after high water, while that on the main bed fell (Fig.4). These observations show that the highest concentrations occur on the south side of the bay and explain why this area has the best spat-fall. Since the Derrymore channel has a depth of 13 feet at L.W.S. compared with 2 or 3 feet on the main bed, the depth at high water is about twice that of the main bed. Thus there is both a higher concentration of larvae, a greater depth of water and, therefore, a far greater number of larvae over any given area of bottom in the Derrymore Channel than on the main bed.

Samples of the larvae were measured under the microscope and it was found that those from Derrymore contained a greater number of fully grown larvae than samples from the main bed. Since the number of adult spawning oysters in Derrymore is less than that on the main bed it is clear that the tidal currents cause the larvae to be driven towards Derrymore during their pelagic life.

On one occasion during flat calm weather it was noted that the period of slack water at high water lasted for an unusually long time. This observation was made from a boat anchored in the Derrymore channel. Due to the narrowing of the bay by the Derrymore Peninsula the tidal flow is very strong, being about two knots at full flood. By 11.05 a.m. on this occasion the current had become quite weak, so that larval settlement could commence. By 11.25 a.m. the flow had ceased. At 11.30 a.m. the flow had re-commenced and continued gently until it again went slack about 11.50 a.m. and then began to ebb at 11.55 a.m. Thus there was a period of over one hour during which settlement of the larvae was possible.

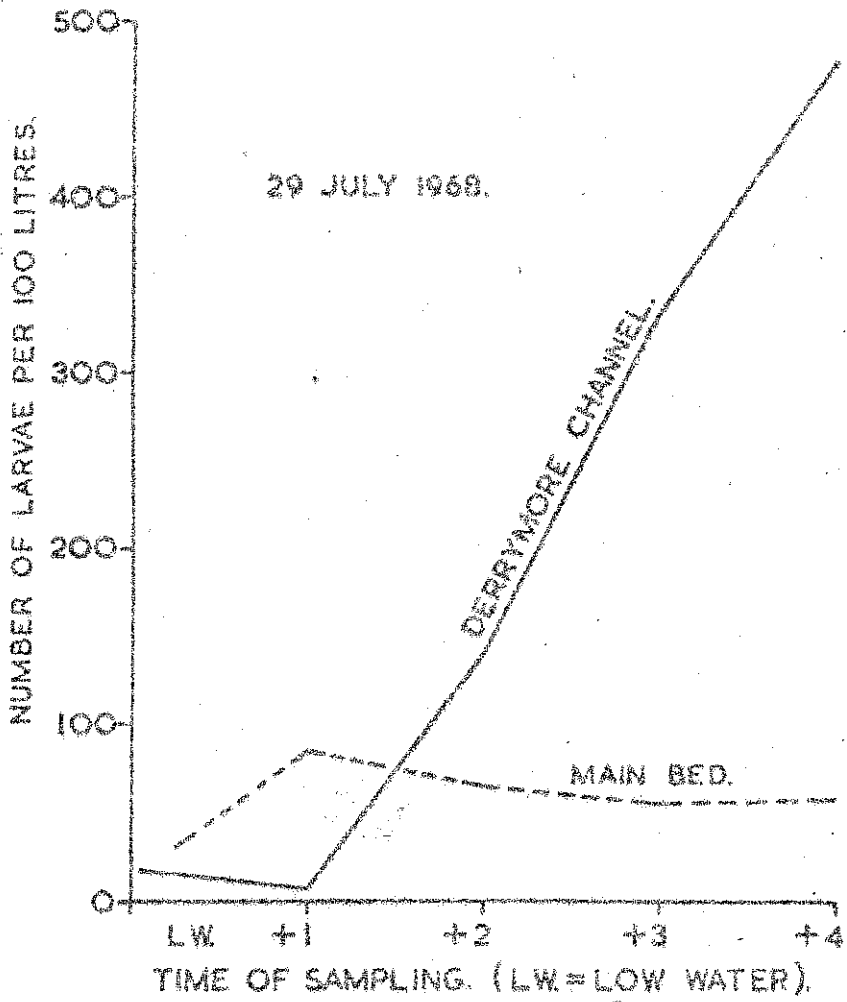
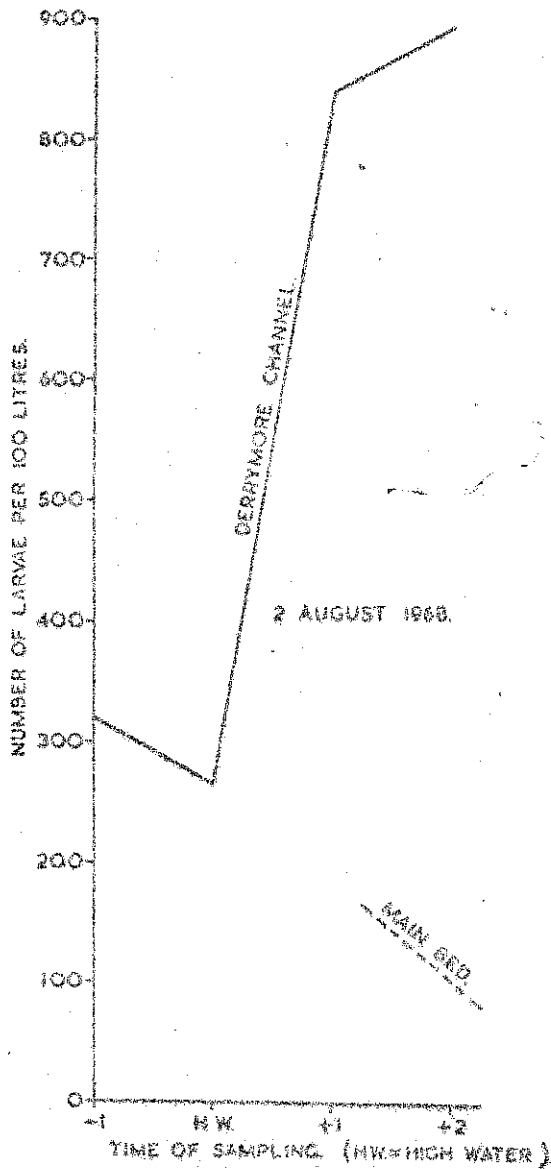


FIG. 3.



Further investigations will be made into this and other hydrological features which are major factors in the success of oyster reproduction in the area and the key to further development.

Water temperatures were also recorded and due to the excellent weather in 1968 these were higher than in any previous year since recording commenced in 1965, reaching a peak of 21.5°C at the end of July. In fact from early July to the end of August the temperatures were above 18°C. These conditions gave the best spat-fall since 1965.

Various types of spat collectors were tested, to find those most suited to the conditions in Tralee Bay. Collectors both on the bottom and hanging from rafts were tried. Due to the strong currents much difficulty was experienced with the rafts. Strings of scallop shells and plastic mesh bags of mussel shell tended to become entangled and also to get broken off the raft. The first gale in the autumn of 1968 swept off all the collectors from the rafts but it was clear by then that settlement on these collectors was poor compared to that on similar collectors placed on the bottom. Very heavy settlement also took place on mussel shells enclosed in 'envelopes' of  $\frac{1}{2}$ " mesh chicken wire placed on the bottom.

A new type of plastic collector was tried out with very promising results. This consisted of sheets of a corrugated polystyrene plastic material which is normally used in sewage and effluent treatment. The sheets were made up into packs and enclosed in  $\frac{1}{2}$ " mesh chicken wire and allowed to sink to the bottom. Various lime/sand/cement mixes and also bitumen were used to coat some of the sheets, but it was found that the untreated sheets gave the best results. As this latter experiment was begun late in the 1968 season it was not possible to draw final conclusions, but nevertheless the results were encouraging. The advantages of the new method were (a) in having a large surface area in a small volume; (b) the light weight of the packs; (c) easy removal of spat; and (d) the fact that the material is not affected by sea-water and can be re-used.

SUMMARY

The Derrymore Channel on the south side of Tralee Bay has a greater spat-fall than the main bed but growth and survival are poorer. The concentration of larvae, particularly of the older larvae, is highest in this area, especially at high water when there is a greater depth of water and a long period of slack water. Water temperatures were high during July and August, 1968 and spatfall was very heavy. Experiments showed that raft collectors were not as successful as bottom collectors and an experiment using plastic sheets gave encouraging results.