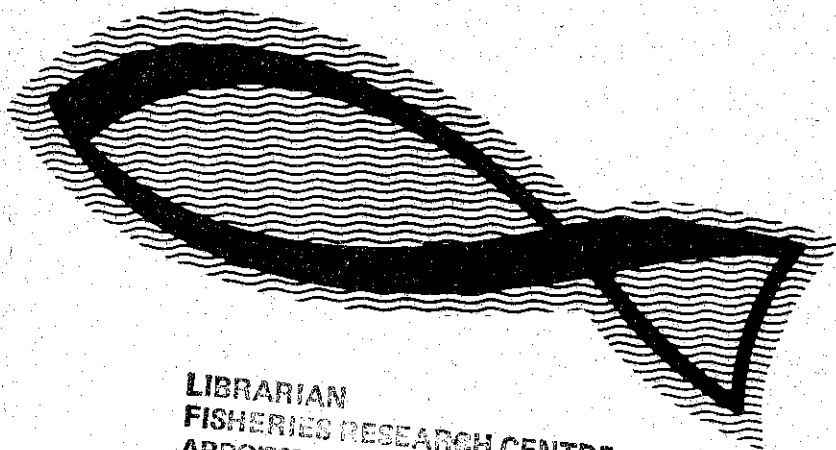




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Escallop fishing around Ireland



by
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ESCALLOP FISHING AROUND IRELAND

By

F. A. Gibson

There are, at present, two main centres of scallop fishing around the Irish coasts, one situated in the inlets forming the north side of Galway Bay, and the other along the south-west coast from Schull, County Cork, to Valentia, County Kerry. The beds exploited in these areas are all inshore, ranging from a short distance to about two miles beyond low water mark and in depths varying from two to twenty fathoms. Extensive beds are uncommon, most of them being small and located between rocky areas where the bottom is suitable. Escallops are generally taken in the months of October to April. Minimum size limits are enforced.

The scallop is a mollusc which has two valves forming its calcareous shell (as distinct from, for example, other molluscs such as periwinkles which have only one valve). The upper valve of the scallop is formed by a fairly flat shell while that of the lower valve is saucer shaped. In its natural feeding position the scallop remains embedded in such a way that the flat valve is at exactly the same level as the surrounding mud or sand. A fine layer of silt becomes deposited upon the flat valve, and this acts as a very effective camouflage of the scallop's exact position. Although scallops of all sizes can swim quite vigorously, it is only on rare occasions that they can be induced to do so. Even then they only swim for very short distances before settling down again and reclosing their valves tightly. They appear to swim short distances in order to avoid the slow-moving starfish which is one of their most serious predators. Of almost 1,000 scallops of ages varying from one to over seven years which were effectively tagged during experimental work carried out by this Department in 1952 and 1953, a total of 280 were recaptured up to the end of 1957. All, with one exception, were taken on the same beds on to which they had been released as much as five years previously.

By the action of numerous special threadlike processes called cilli, water is drawn into, and later expelled from, the shell cavity. The inhalant current brings with it fresh supplies of water for breathing and food particles which are transported to the mouth by the rhythmic motions of the cilli. The exhalant current bears with it the unused food and other particles, and also the waste products of digestion and breathing. Escallops utilise relatively large quantities of food, in the form of plankton (tiny organisms found in sea water) and detritus, i.e. lifeless material. If the flat valve of an scallop is cleaned and examined it will be seen to bear a series of concentric rings or furrows. These are laid down each year between October and March. During this part of the year little or no growth is made because sea temperatures decrease to their lowest, the scallop becomes inactive, and the food supply becomes scarce, so that the rate of feeding is at a minimum.

A ring or check in the growth rate is formed annually which indicates this period of almost total cessation of growth. In many cases the width of this ring is no more than $1/32$ nd part of an inch. By counting the number of these rings on the flat valve, therefore, the age of any particular scallop may be determined. The distance between each ring and the next represents for all practical purposes, the fast growth rate made from April to September, when conditions for feeding attain their best. During the first five or six years growth is rapid. Thereafter it diminishes so that, for example, after the eighth or ninth winter as little as one-eighth of an inch of growth may be made during the following summer. Between three and four and a half years of age, scallops in Irish waters grow approximately to a size of four and a half inches along their greatest length. At this age they will have spawned at least once. The purpose of the minimum size limit for scallops is to ensure that those below this size shall be able to contribute to the general spawning effort at least once before they enter the commercial fishery. The male and female parts of each scallop are combined within one region which is known as the gonad, and popularly called the "tongue". The male part of the "tongue" is white or ivory, and the female a bright pink or red, when the scallop is ripe or "full". This organ is the yardstick used on the market to determine quality for the purpose of sale in the shell. When the gonad is firm and brightly coloured, scallops are said to be of good quality. There is little demand in European markets for scallops with colourless and flaccid gonads, although this may not hold for American markets where the gonad must in any case be removed before presentation. During the late spring or early summer, and again in early autumn, the ripe eggs are extruded from the female part of the gonad. They are fertilised by the male elements which usually ripen first. The fertilised eggs quickly develop into free-swimming minute creatures called veliger larvae. After a short free-swimming life, they settle down and, providing that they come to rest on suitable bottom, quickly change their shape and take on that of miniatures of the adults. Vast numbers of eggs are produced by each scallop, and this is nature's device to ensure that at least an essential proportion of them have a reasonable chance to survive and become adults.

This résumé of the natural history of the scallop is related in order to emphasise the speed of growth from birth to marketable size and, therefore, the value and gain of returning to the beds all small scallops caught while dredging. It also illustrates that the scallop, though capable of swimming, is more or less sedentary in its adult life. All sizes of scallops are found associated together in the same beds so that there is every chance that the small or under-sized ones which are returned from the catch to the sea may be relocated in the same beds into which they were released. As has been shown by experiments carried out by this Department, movements of half a mile are exceptional. It is probable that the juvenile scallops settle down on particular beds where they remain for the rest of their lives.

There are two main methods employed for capturing scallops in Irish waters, mainly (1) by brideog or long-poled hand net, and (2) by dredging. A brideog consists of a young larch or similar kind of pole, to one end of which is firmly lashed an eight inch diameter metal ring. The pole is usually not less than twenty feet long. A small meshing bag is lashed to a metal ring. On calm clear days the scallops are "shaded". The brideog operator searches the bottom by

peering through a cutaway biscuit tin, or other "shading" contrivancy, and when he observes the white gleam produced by the overlap of the round open and flat valve of an escallop, the brideog is lowered to it and the metal ring is used to tip the escallop out of its seating over the rim of the ring and into the bag. This method of fishing produces large numbers of escallops but it is so dependent upon the state of the tide and clemency of the weather that it cannot often be practised.

Two variations of the one design of traditional Irish escallop dredge are commonly used, the larger on the south coast and the smaller on the west coast. These dredges consist basically of rectangular frameworks varying from 3ft 6 inches to 5ft 6 inches in length. Three rigid bridles are welded to this frame, and they meet in an apex forward, the ends of which are welded together and linked by a metal ring or eye for towing purposes. The lower side of the framework is a straight edge to which teeth are firmly riveted. The teeth are usually made of mild steel and seldom buckle on rough ground. Each tooth is about $3\frac{1}{2}$ inches in length and set at $2\frac{1}{2}$ to 2 inch intervals, at an angle of approximately 45° to the plane of the bridles. A sisal net bag, attached to the back of the frame, completes the picture. At least three methods are employed to operate the traditional Irish dredges. These are:-

- (a) by sail and row boat,
- (b) by anchor line and winch,
- (c) by motor power.

The combined power of wind and tide and the use of sail is sometimes still employed to tow the dredge along fairly solid bottom. The second method uses a special dredge boat which drops anchor and, moving off, pays out about one hundred fathoms or more of anchor line. The dredge is then shot and towed along the bottom by pulling it against the strain maintained by the anchor rope. A small hand winch is often mounted amidships for this purpose. A small engine can also be put aboard to do the work of the hand winch. Dredging by motor power, not being dependent upon weather (to anything like the extent of hand dredging) enables a very much more extensive and varied area to be fished. Motor power allows for greater fishing effort which in turn produces greater quantities of escallops. Another advantage of motor power is that it is possible to undertake prolonged and uninterrupted tows and therefore to operate in deeper water where escallops may be more plentiful. Using the manual methods described for (b) above, a good daily yield of escallops in Irish waters is about thirty dozen per day. The smaller cost of hand power compared with motor power, is offset by an increase in yield of at least 50% from power dredging. To further increase the efficiency of power dredges, the British Ministry of Agriculture, Fisheries and Foods Experiment Station at Conway, North Wales have devised a sledge dredge. A slightly modified version of this dredge has been used experimentally in Irish waters. The results of these experiments, made in April 1955, showed the remarkable manoeuvrability of this new dredge and illustrated the ease with which a small boat can tow it along the bottom. The sledge dredge was also found to be significantly more productive of commercial-sized escallops than a traditional Irish dredge of southern design which was tested against it. Mr R H Baird

of the Fisheries Experiment Station at Conway, North Wales, using a frogman's outfit, observed the action of a traditional Irish dredge of southern design, and found that it proceeded along the bottom in a series of long shallow leaps, and that the amount of bottom untouched during these leaps consisted of as much as 80% of the total distance covered by each tow. This action would be equally typical of a dredge of western design. The "feel" of a tow rope from a traditional Irish dredge consists of a series of jerky alternate tightening and slackening of the tension on it. This is caused when the teeth dig into the sea bottom and thus build up a series of heaps of bottom material in their path from which the dredge must escape by leaping through the water when the tension on the tow rope becomes too great. However, the runners or skids of the sledge dredge slide along the bottom and prevent the teeth from "digging in" to a depth of more than three-quarters of an inch. This avoids the building up of heaps of bottom material, with the result that the dredge remains on the bottom for almost the whole of the length of a tow. The increase in working efficiency resulting from this is quite clear.

It has been observed that one of the only conditions under which the sledge dredge will not operate as efficiently as it ought to is when the bottom of the sea consists of a series of ridges. On such a bottom the sledge dredge passes over the crests of the ridges, and is thus prevented from taking any scallops which are located in the hollows between the ridges. This bottom condition, however, does not occur very often where scallops are plentiful.

The sledge dredge is maintained on the bottom by a diving plate which exposes its surface to the downward thrust and pressure of water. This force increases proportionally to the depth. The diving plate is shaped on the style of an anoplane, so that when the dredge is being shot, water may pass either under or over the plate. Thus this ensures that, properly handled, the sledge dredge will not somersault during shooting and will therefore reach the bottom with the teeth in their fishing position. A sledge dredge will be found to be most conveniently shot from the stern of the boat and preferably by using a derrick. In order to ensure that the dredge will arrive on the bottom in its correct fishing position it is advisable to reduce speed to very slow ahead as the dredge is being shot, and not to check it during its descent. As soon as the dredge touches bottom the towing warp or hawser is then checked and the engine of the boat set at slow ahead. If it is desired to increase the speed of dredging, then additional warp must be paid out in order to avoid what is termed positive lift, which will have the effect of lifting the dredge completely off the bottom. A small boat with a 10/12 J H.P. inboard engine is capable of towing at least two sledge dredges which have a five-foot tooth bar, without undue wear and tear on the engine. However, a small winch or capstan is necessary to bring the dredge alongside conveniently. With knowledge of fishable areas, fishermen could utilise the sledge dredge more effectively than the traditional Irish dredge, and they could use it for fishing in restricted areas more productively. It is preferable to use wire hawser instead of rope warps. The hawser, by its own weight in water, lies concavely out and downwards from the boat during towing, with the result that a dredge is pulled along the bottom and parallel with it. On the other hand, rope warp is supported by water, and therefore lies convexly out from the boat, and thus tends to pull a dredge off the bottom. However, by using an aftertow position on the sledge dredge it is possible to use rope warp with reasonable success.

Research work done by this Department together with much information supplied by many Irish fishermen, has shown that the scallop is very widely distributed around our coasts, in areas both inshore and offshore where as yet they have not been exploited. Inshore beds probably exist in very sandy bays or inlets on all coasts, though scallops are not necessarily there in commercial quantities. There are also clear indications that scallops are found well offshore from the Counties Wexford, Waterford and Cork, and to a considerable extent along the fishing banks from Kish to Clogherhead on the east coast. Normally scallops are dispatched to market in the shell, packed in sacks. They travel reasonably well in cool weather, though frost kills them quickly, and they are weakened during warm weather. In recent years large quantities of scallops have been processed in Ireland prior to their export. In other countries (especially Tasmania, USA and Newfoundland) scallops are usually deshelled and cleaned aboard the boat. This is, of course, only practicable if they are iced during fishing operation, and where freezing facilities are convenient to the landing places. Motor powered dredges, during long tows, provide time in which to deshell the catch by opening, cleaning and packing the washed meats into well iced containers.

The following description of the method of cleaning scallops will be found useful. Each scallop is opened by holding it tightly in the palm of the hand with the flat uppermost. An oyster - or similar - strong knife is inserted through the space which will be found between the two valves at the "ears". The end of the knife is incisively moved in the direction of the outer edge of the shell so that the upper valve is cleanly cut free of the muscle attached to it. When the free upper valve is removed, the scallop will be found lying inside the round valve. The beard, orange-coloured gills, black digestive gland and the gut surrounding the muscle are removed with the aid of the fingers, a knife or a pair of scissors, taking great care not to remove the "tongue" from the muscle in doing so. The remaining meat and "tongue", after careful washing, must be cleanly cut out and scraped clear, taking care not to leave behind any of the meat. It is drained of excess liquid and stored away in iced containers. Approximately twenty pounds weight of ice should be used to keep the meats extracted from each 30 dozen of scallops in a sufficiently cool state so as to be presentable for freezing purposes ashore.