International Council for the
Exploration of the Sea

C.M. 1963
Shellfish Committee
No. 81

Winter Inflicts a Deadly Blow to the Dutch Oyster Industry

By

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Oyster culture all over the world is notorious for its ups and downs, for its often unexpected drops in production. Notwithstanding man's efforts to promote spat collection and to protect the growing oyster against their many enemies, the number of consumption oysters often falls short of the expectations.

On earlier occasions I have dealt with the vicissitudes of the Dutch oyster industry. I explained which factors led to a rapid increase of the oyster stock in the first years of real oyster farming, following the withdrawal of the Yerseke Bank from the free fishery in 1870, next how the winter 1890-1891 inflicted serious losses, up to 60 % of the stock, the consequences of which were reflected on the sale of consumption oysters for several years; further how serious difficulties attributable to the slipper limpet, Crepidula fornicata, and shell disease led to a catastrophic drop in the production in the 1930's.

Scientific research led in due course to control of slipper limpet and shell disease, and to an increasing production of oysters of good quality. Gradually the old prosperity returned. Various measures to further the production ultimately led to an annual sale of some 30,000,000 consumption oysters which placed the Netherlands as a good second in the list of countries producing the flat oyster, Ostrea edulis, leaving most of the other countries far behind.

During the 1958 Council Meeting I explained how the Dutch oyster culture became endangered by the Delta project and what measures were considered to ensure its continued existence. Suggestions were made to create an artificial oyster basin in the western section of the Grevelingen after its enclosure, in which basin flushing, current velocities, and plankton production would be kept under control. Plans were worked out to construct a pilot project behind the enclosure dike near Veere in the years 1963-1964. Practical experiments would be carried out here to study possibilities and snags of oyster culture on a sandy bottom with low but sustained current velocities.

It was a serious disappointment to learn that hydrographical investigations had led to the conclusion that the Grevelingen project could not rely on a regular supply of water of a sufficient high and stable salinity, not even during the warmer months, May to October, when the activity of the oysters requires continuous flushing of this man-made area. This led to the unavoidable decision to cancel the construction of the pilot project near Veere. Enclosure of the Oosterschelde, scheduled for the year 1978, would irrevocably mean the end of the Zeeland oyster culture, an industry which would then have brought prosperity in Zeeland for over a century.

Nature decided otherwise. Winter came unusually early in the oyster season 1962-1963. Freezing set in as early as November; after a somewhat milder period early in December, winter became very severe in the last third of December. Ice was soon observed on the water of the Oosterschelde, but large stocks of oysters had timely been accumulated in the oyster basins, so that the sale would go on for quite a while, even when fishing would be impossible. January was bitterly cold indeed, but shipment of oysters continued, be it that the low temperatures required extra care in packing and shipping the oysters. Work in the basins, which can be flushed every tide, irrespective of weather conditions, and from which ice can be removed by hand, was hard and unpleasant, as it always is in severe winters. One basin remained permanently free of ice since it was artificially heated to a few degrees above the freezing point. The heating system, gas flames burning under water, answered the expectations even during the coldest spells. The frosty weather continued for an unusually long time. By mid-February milder weather seemed to be drawing near. The supplies of consumption oysters in the basins were at that time almost exhausted; some oysters started to die in the basins for no obvious reason. The oyster spat had settled very late in the cold summer of 1962 and was therefore of very small dimensions when winter set in. Observations made on tile collectors in mid-February 1963 demonstrated, however, that virtually all the spat kept well under the level of the ice-floes was still alive despite its small dimensions.

Unfortunately, the temperature dropped again and ice covered the water of the Oosterschelde in enormous quantities, not to disappear until the middle of March. This

means that the water temperature must have been at the freezing point, -1.7°C, for nearly 3 months in succession. This had never happened before since the beginning of the Zeeland oyster industry in 1870. The renowned winter of 1890-91 was of much shorter duration. For the oysters living under the low water spring level, the actual air temperature is not important at all; what counts is the number of days that water is as cold as -1.7°C.

The consequences were disastrous. In the course of the month of February oysters in the basins died at an increasing rate. This eventually led to the virtual exhaustion of the stocks. In the heated basins the oysters suffered no losses at all. The oysters became weaker and weaker, were not able to keep their valves tightly closed and accumulated more and more silt and sand between their valves. Finally death strikes. The parasite Hexamita may play a part according to the speed at which the resistance of the oyster reduces. It apparently did not adversely affect the oysters stored in the heated basins. After thawing up the oyster farmers found their hopes shattered. Not a single life spat could be found on the tiles or the shell collectors. Oysters well sheltered under a thin layer of sandy silt had not survived, as they normally do in severe winters. Some adult oysters were still alive, but they apparently could not throw out the sand and silt which had penestrated in between their valves. Still it is hard to explain the oysters' weakening after many weeks of frost for they had not used up their reserve material to cope with adverse conditions. Most of the oysters died with still an appreciable reserve supply of glycogen in their connective tissues. It is as if their nerve system gets too tired in the long run and looses control, which makes the oysters gape.

On virtually all the plots the mortality was extremely high, much higher than after the notorious winter of 1890-91 which led to an estimated overall mortality of 60 %. Now the oyster farmers often counted one basket of living, but often rather weak oysters on 100 to 200 baskets of empty shells. About 1 % of the stock of over 100 million oysters of two years and older survived the disaster. No surviving spat and few surviving yearling oysters have been found. As far as could be observed during extremely low tides the "wild" oysters attached to stones at the feet of the dikes of the Oosterschelde have been killed off to nearly 100 %. Empty shells were here and there cast ashore, shells which could not be attributed to cultivated oysters.

This all means a deadly blow to the Dutch oyster industry. Very few oysters would be available for the market in the next season. Higher prices cannot possibly make good for the losses. Importation of French oysters for relaying in the Oosterschelde was only possible on a limited scale since France too had suffered from the severe winter, so that the supplies were meagre. At the time of transportation the Brittany oysters were not yet so strong as usual; therefore part of them died after relaying on the Zealand plots. Some oyster spat was introduced from Norway, but it will take years to grow those to a marketable size, if they do survive the winters to come. In these years the Norwegian spat is kept for a shorter time in the warm polls than formerly, which may increase their resistance to winter weather.

Most of nearly 200 oystermen reluctantly decided to quit. The Delta project makes every long-term effort to build up bit by bit a new stock of oysters most unattractive. A quick revival through mass importation of flat oysters from other countries seems impossible. Oyster stocks resistant to the normal Dutch winter are nowhere available. French oysterscan be safely relaid on the Zealand plots to be harvested as consumption oysters on the approach of winter, but keeping them over winter entails serious risks. Spanish oysters cannot even withstand a mild Dutch winter. The thin-shelled Norwegian oyster spat is first vulnerable to the attack of crabs and next of doubtful resistance in winter.

Sometimes it is stated that catastrophic mortalities evokes Nature's reaction, that reproductive activities are stepped up after such a disaster. It is difficult to see how Nature can arrange for a higher rate of reproduction, except in cases of food shortness for the larval stages, which could lead to higher survival rates in years in which few eggs are spawned. Observations on the number of oyster larvae in the water of the Oosterschelde in the summer of 1963 revealed that this number is fully commensurate with the number of mother oysters. The number of oyster larvae fluctuated in 1963 between 10 and 30 per 100 litres of water, instead of between 500 and 2,000 as in previous years in the middle of the season of reproduction. Even with a higher survival rate it seems very doubtful whether one can expect a reasonable number of oyster spat on the collectors. Since tile collectors require considerable manual labour, one must harvest at least 25 spat from each tile for remunerative work. The conditions in 1963 did not promise more than at the utmost 5 spat per tile which made the oystermen decide to keep their tiles ashore. Some dozen of oystermen who decided to continue their industry scattered mussel shells as collectors and hope to find some spat in due course.

It is a very sad duty indeed, to report how the once so flourishing and technically highly developed Dutch oyster industry came untimely to an end.

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