

33.—A VISIT TO THE CHIEF FISHING PLACES OF JUTLAND.*

By C. G. VON OTERENDORP.

The principal result of my observations was to convince me that, if anything, the wealth of fish on the coast of Jutland is not so great as on the German coast of the North Sea; but the favorable results obtained are due to the energy and skill of the Danish fishermen, who, with much toil and danger, take this rich booty from the waves of the sea.

Fredericia was specially interesting for its extensive eel fisheries, in the Little Belt, and Randers for its large flord fisheries, which unfortunately during my visit were seriously hindered by the ice. Of still greater interest to me was Frederikshavn, for at the time of my visit considerable quantities of Swedish herring were landed there by the Swedish fishing-boats, which are small but neat and seaworthy. These herring are carried by railroad to nearly every town and village in Jutland, where they are both a cheap and fresh article of food. Many are sent to the Sleswick-Holstein smokehouses, a large quantity goes to Germany, and car-loads of fresh herring are sent to Belgium.

The transshipment is managed in a practical and convenient manner, as the car-tracks run close to the landing-place of the fishing-boats, where the fish are transferred direct from the boats to the cars. The Danish Government is constructing an additional larger harbor-basin, as the present one has proved too small for the very considerable traffic, and no longer meets the demands of the fisheries.

Permission is readily granted to the fish-dealers to use the harbor for a larger number of fish-tanks. At the time of my visit these tanks contained only plaice and lobsters. Cod, eel, plaice, and lobsters keep very well in them; only when a cold east wind sets in, the lobsters suffer very much, because under these circumstances deeper tanks than those in use at present are required. The new harbor-basin will in every respect be better adapted to these purposes.

The best Swedish fishing-boats, admirably adapted to line-fishing, are said to be made by Isaac Andersen Russø, of Strömstad. They cost about 3,000 crowns (\$804) apiece, but have to be furnished with more ribs and an inner keel for use in the Danish waters. The fish caught all along this coast, as far as Skagen, are brought principally to Frederikshavn. The haddock caught in the neighborhood and brought here are small; but the cod, halibut, and plaice are larger and are brought in greater quantities. Large quantities of the last-mentioned fish are sent to the Sleswick-Holstein smokehouses, or to Copenhagen to be consumed fresh.

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From the east coast I went to the north coast of Jutland, but as there is no protection whatever for fishing-vessels, only very light boats can be used on this open coast; they are principally open keel-boats, drawing $2\frac{1}{2}$ to 3 feet of water, with a suitable quantity of water-ballast and a crew of three to five men. In line-fishing the Lönstrup, Löcken, and Blockhus fishermen use 7,200 hooks for catching haddock, cod, and halibut till February; and from February they catch plaice, and also haddock and lobsters, with seines. Experiments with the seines used on this coast, which are taken out by two boats, might be advantageously made on the German coast.

The conditions are very similar along the entire west coast of Jutland from Skagen to Riff Horn. In many places light and sometimes flat-bottomed boats, which are seaworthy on account of their breadth, are used, and are generally manned by two, four, and even seven fishermen. On this long coast-line many men are engaged in gaining a living from the sea, and thus benefit the country in general; but the lack of suitable harbors is felt keenly, and many lives are lost in these fisheries. The construction of harbors on this sandy coast would involve a considerable expense. The fishing population, however, is liberally assisted by the Government, which, among other things, places every year eight fishing-boats at the different stations, which may be used by the fishermen whenever their own boats have been damaged.

The Danish Government has not been slow in finding the most suitable places for constructing harbors. As I have already mentioned, a new harbor has been constructed at Frederikshavn, and another (called Esbjerg) on the southwest coast, in the shelter of the island of Fanøe. Fifteen years ago only one house was standing here, and today upwards of 2,000 people are living at Esbjerg. This place evidently has quite a future. It is the principal port of exportation for the products of Jutland; cattle, butter, and eggs, and in spring fish are sent from here to Newcastle and London, two steamers per week sailing for these ports. The expectation that fishermen would settle at this place has been realized, for about one hundred persons living at Esbjerg are engaged in the fisheries. The harbor of Esbjerg is much used by the Fanøe fishermen, and as a port of refuge by German fishermen.

The Jutland fishing-grounds are not so rich as those off the German coast of the North Sea, and the large quantities of fish caught off Jutland are owing to the circumstance that more persons are engaged in the fisheries than with us, and also because the fishermen follow more rational methods of fishing.

A Norderney line-boat (sloop) generally uses in line-fishing a line with 3,000 hooks per day, and is usually manned by three persons, sometimes three fishermen and a boy, so that of the profits three parts go to the fishermen, one part to the owner of the boat, and occasionally one-tenth to the boy. Some Danish boats have two fishermen; the boat represents but a small value, and is owned by the two fishermen

in equal parts. They use 3,500 hooks, therefore more than our boats. Even if these Danish boats catch one-fourth less than our boats, the two Danish fishermen make as much, because their expenses are smaller and because their lines represent only a small capital. The same applies to the larger boats, which are worth from 400 to 500 crowns (\$107.20 to \$134), have a crew of 4 or 5 men, and use from 6,000 to 7,200 hooks. The advantage which the Danish fishermen have over ours becomes still more apparent where deck-boats are employed, as is the case at Esbjerg. These boats are very seaworthy, draw $5\frac{1}{2}$ feet of water at the stern and $4\frac{3}{4}$ feet at the bow; their length is 25 feet along the keel, and 35 feet over all on deck; and, like the Swedish boats, they are very broad. The price of such a boat is 2,500 crowns (\$670) at the wharf. These boats have a crew of 6 to 8 men, and sometimes set as many as 15,000 hooks. It will easily be understood that this method of fishing is more remunerative than ours, as a Norderney boat, even under the most favorable conditions, if manned by 3 men (4 shares), catches about 1,500 fish, while an Esbjerg boat, manned by 8 fishermen, catches as many as 5,000 fish. Each one of our fishermen, therefore, gets about 370 fish, while each Danish fisherman (8 fishermen = 8 shares, boat = 1 share, total = 9 shares) gets about 550 fish. The Danish fishermen, can, therefore, afford to sell their fish somewhat cheaper. Our fishermen can catch 1,500 fish with 3,000 hooks; while the Jutland fishermen, who use five times as many hooks, ought therefore to catch five times as many fish (7,500), but this is not the case; and I am, therefore, convinced that our waters contain more fish than the Jutland waters; and, as a general rule, the plaice caught on the west coast of Jutland are leaner than ours. The large quantities of plaice caught on the coast of Jutland are sent to Sleswick-Holstein to be smoked, or by way of Frederikshavn to Copenhagen. Swedish fishermen buy plaice at Löcken, and take them as far as Christiania and other Norwegian ports. Whenever during the prevalence of south winds German fishermen are fishing near Riff Horn and beyond, and there catch sometimes a boat-load of plaice in 12 hours, it might be recommended to them, in case the wind prevents them from reaching the German or Dutch markets, to make an attempt to sell their fish in Norway, as no plaice are caught near the Norwegian coast, and as these fish fetch a good price there.

Of the Lymfjord fisheries, those for oysters were particularly interesting to me. It is well known that after (in 1825) the narrow neck of land which separated the Lymfjord from the North Sea was broken, oysters began to make their appearance in the fjord. The current probably carried the spawn into the fjord from the North Sea, for this oyster has exactly the shape of our North Sea oyster, but, owing to the condition and depth of the water, the shell of the fjord oyster is not so strong. Some years ago the Danish Government derived an income of 240,000 crowns (\$64,320) per annum from renting out these oyster-fish-

eries, including a small bank in the Cattegat; while now the fisheries have gone down so much that the rent is only 48,000 crowns (\$12,864) per annum. In my opinion this is caused by the circumstance that during continuous east winds too much water from the Baltic, which is not very salty, enters the fiord. It can hardly be supposed that severe frost should have caused the decline of the oyster fisheries, unless there are such undercurrents as to favor the formation of bottom-ice. The apparatus used in the Lymfiord for catching oysters seems to me very destructive, as the bow of the net has teeth instead of being smooth. The bottom, which is not very rocky, is therefore considerably torn up, and does not afford any firm hold for the young oysters. I was informed that various attempts had been made to raise oysters artificially, but so far without success. I think, however, that the waters of this large fiord must have many sheltered places where young oysters could be raised in large quantities.

Broom and heather placed horizontally, in hurdles 4 feet broad and 6 feet long, above the present oyster-beds, in places where there is the least possible current, would probably yield a favorable result. To prevent these hurdles from being covered with aquatic plants they should not be set till the 15th or 20th of May, as it will not hurt if they are overgrown with plants later. I would state regarding oyster culture that the spawn of oysters prefers to adhere to rough, dark brushwood. Heather and broom have been advantageously employed. Oyster fishing, and in fact all fishing, should be strictly prohibited in these places. I am confident that success will crown these efforts if they are made in places where there is but little current. The results would certainly be favorable if the hatching places were properly inclosed; but this, of course, is more expensive.

In conclusion, I would state how profitable oyster culture may be for a country. The Dutch oyster-beds near Jersecke in 1870 yielded a rent of 20,651 florins (\$8,301.70), but after artificial oyster culture had been introduced these beds (including those of the East Scheldt) yielded an annual rent of 508,665 florins (\$204,483.33).

Jersecke, which in 1870 was a poor fishing village with 1,013 inhabitants, has at present a population of 2,832. Twenty-two millions of cemented tiles serve as spawn-collectors in the East Scheldt and on the Jersecke oyster-beds; and in 1884 there were many tiles which held as many as 300 young oysters. The waters of the Lymfiord, in spite of having less food, would probably show even greater results.

The banks in the Zuyder Zee near the Island of Wieringen, which are rented out by the Dutch Government for the purposes of oyster culture, already yield an annual rent of 50,000 florins (\$20,100), and this sum is paid for grounds which as yet have not produced any oysters, and which only as late as last year were supplied with mother-oysters from the great German oyster-beds in the North Sea.

NORDERNEY, GERMANY, *February 25, 1886.*