Experiments in Transplanting young Plaice from the North Sea and the Limfjord to the Belt Sea and adjacent Waters in the Spring of 1928.

By

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The great development of the plaice fishery in the Belt Sea and the adjacent waters during the period 1910—20 raised the yield of the fishery to a height that could not be maintained permanently. A disquieting fall in the yield has occurred since the end of the war, and year by year the yield in weight has diminished. Whereas the total annual yield of the plaice fishery in the Belt Sea during the two last years before the great war (1912 and 1913) was ca. 3.000 tons, and during the two first years immediately after the war (1919 and 1920) ca. 2.400 tons, it has decreased in recent years to ca. 1.000 tons. We are seeking for some means to counteract this enormous diminution in the yield and are devoting our attention especially to a more rigorous protection of the fish than that which is at present in operation and also to introducing fish from the North Sea or the Limfjord.

The average weight of the marketable plaice caught in the Belt Sea is about 250 grams per fish and the number of plaice caught annually by fishermen in recent years amounts to about 4 million. In addition to this we must reckon that some million are destroyed each year by fishing operations before they attain a marketable size, and that the enemies of the plaice — especially cod — also destroy a considerable number. It is thus clear that if the fishery is to receive effective assistance, by young fish being introduced from other regions, several million must be planted annually.

The transplantation carried out during this year in April and at the commencement of May has been of an experimental nature and has

involved the use of only about a million fish, but it may nevertheless be assumed that the experiment has been so comprehensive that the effect of the plantings in several places will be perceptible to those engaged in the commercial fishery. It is possible to a certain extent to ascertain how great a percentage of the catch is derived from the plaice transplanted from the North Sea and the Limfjord, since these have a greater number of fin rays than the Baltic fish.

In comparison with the plantings in the Belt Sea, those in the adjacent waters have been inconsiderable, as may be seen from the figures given below:

	Number of fish transplanted
Belt Sea	ca. 1,044,000
Western Baltic	111,000
South-western Kattegat	169.000
Isefjord	34.000
Øresund	41.000
Baltic off the shores of Sealand and Møen	31.000
	ca. 1,430,000 fish

The aggregate weight of the transplanted fish was ca. 103,000 kilograms. The transplanted fish originated from the following regions:—

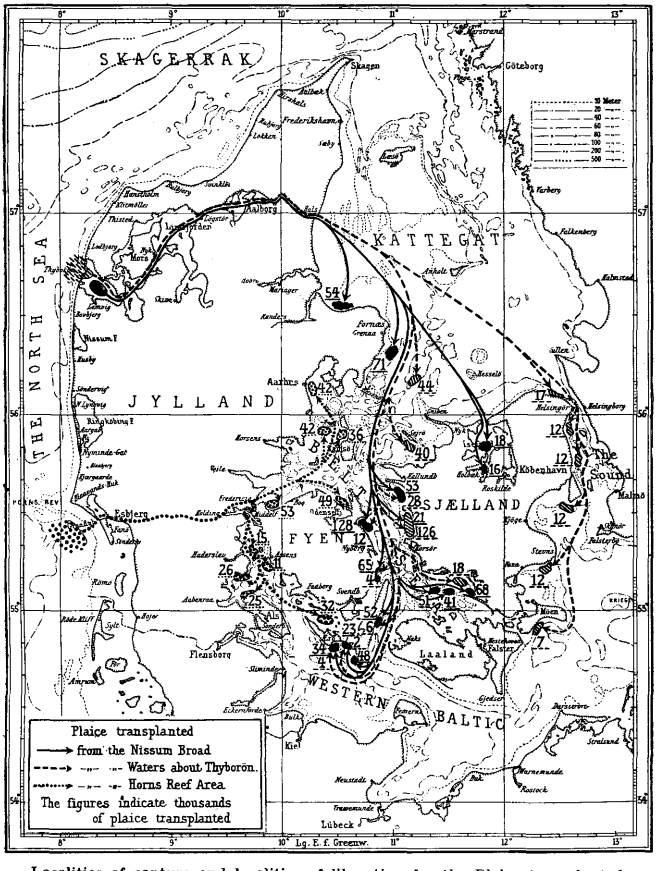
	Weight in kg	Number
Nissum Broad, Limfjord	39.200	743.000
"Thyborøn"	28.500	356.000
Horns Reef Area	35.300	331.000

The fish from "Thyborøn" were mixed, some being caught in the western portion of Nissum Broad, others in the North Sea in the neighbourhood of Thyborøn Channel. Both these fish and those from Nissum Broad were transported from the place of capture to the place of liberation in well smacks carrying from 2.500 to 3.500 kilograms. The fish from Horns Reef Area were transported partly by motor lorry and partly by rail from Esbjerg to Fredericia, where they were kept in floating boxes for about 5 days prior to liberation. At the places of liberation (see the figure on p. 369) the fish were scrutinized as to condition and quantity by fishery officials on board steamers belonging to the Fishery Board ("Falken" and "Havørnen") and the price agreed upon for the fish was paid only for those which were judged to be in good condition.

The length of the transplanted fish varied from ca. 14 to 27 cm. and the average weight was as follows:—

	Weight per 100 fish
Fish from Nissum Broad	5.28 kg
Mixed fish from Thyborøn	8.00 -
Fish from Horns Reef Area	10.66 -

The cost of the transplantation, which was defrayed by the Danish State, amounted to ca. Kr. 45,000 or a little over 3 øre per fish.



Localities of capture and localities of liberation for the Plaice transplanted.

The transport of the fish was to all appearances carried out successfully. Only two or three per cent. of the fish died during transport and only two or three per cent. of the live fish were injured so badly that they had to be rejected when the places of liberation were reached. The fish transported by land seemed to be just as lively when liberated as those transported by well smacks from the place of capture to the place of liberation, and this fact is of the greatest importance for the planting of fish in the Belt Sea and western Baltic, since the fish transported by land can be supplied to these waters at much less expense than those transported by well smacks from the Limfjord or the North Sea.

In order to obtain information as to the growth and migrations of the fish planted, and in order to collect some data as to their behaviour in general, 3000 of these fish were marked at 30 different places where liberation took place. In addition 430 plaice were marked at the places where they were captured in the inner Danish waters. The aim of these two series of investigations was to ascertain whether there are any differences between these two groups of fish as regards mortality, growth and migrations.

Up to now no differences have been observed in respect of the migrations and the rate of growth of the two groups of fish, but there has been a marked difference as to the percentage of recaptures. Of the marked transplanted fish not nearly so many per cent. have been recaptured as of those indigenous to the Belt Sea. This fact seems to suggest that the mortality caused by other factors than fishing operations has been far greater in the first group than in the latter.