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Preliminary results of a plaice transplanting experiment from the North Sea into the Kiel Bight

by

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At the 26 and 27 of March 1973 200 respectively 76 North Sea plaice have been tagged and released in the Kiel Bight near the Kiel Light vessel at 54° 34'N, 10° 41'E and 54° 31.5'N, 10° 25.5'E.

The young plaice were caught NW of Helgoland by the RV "Friedrich Heincke" just before leaving the North Sea and heading for an research trip into the Baltic Sea. The idea of transplanting plaice from the North Sea into the Baltic Sea was not to continue with the experiments carried out since 1909 and 1914, 1928-1933 by Danish and German scientist aiming to restock the heavily exploited Western Baltic and Belt Sea with North Sea plaice, but to find out whether transplanted plaice would behave in the same way as 40 years ago.

During the short stay at Cuxhaven and the trip through the Kiel-Channel the North Sea plaice were kept in tanks with a closed water circulation. After leaving the lock at Kiel the plaice were slowly adapted to the new environment by pumping Baltic Sea water into the tanks.

At two different positions near Kiel Light vessel 276 plaice were tagged with red soft plastic discs as described by Rauck (3).

2/-

The length distribution of the tagged plaice is given in Fig. 1.

About one year after the plaice were released 62 (22.5%) were recaptured. Compared to experiments described by E. Fischer (2), young plaice transplanted from the North Sea into the Kiel and Lübeck Bight resulted only in 7% recaptured fish after 5-6 months. According to E.Fischer the low figures are related to the low fishing activity on plaice due to the low density of plaice in this area.

Danish plaice transplanting experiments however from the North Sea into the Belt Sea carried out in 1928-1933 (H. Blegvads, (1)) resulted in about 30% recoveries. According to Blegvads this relatively low figure compared with tagging results of Baltic plaice (50%) is due to a higher mortality rate caused by the lorry transportation from the North Sea to the Baltic Sea.

Travel distance and direction.

The travel distance of the transplanted plaice in the Belt Sea can be considered as moderate within the first year. Out of the 62 recovered plaice 46 remained within the range of 30 nms, 15 within the range of 60 nms and only 1 plaice left the Kiel Bight through the Great or Little Belt and was caught in the Kattegat near Anholt island. The arrows (Fig 2) indicate the direction of each recovered plaice, the figures give the number of days in freedom.

87% of all recovered plaice went northwards, 5% only went to the West and 8% to the South. This movement to the North is obviously linked with a higher salinity in deeper waters. The average depth of the Kiel Bight, where the plaice were released is about 17 m. Most of the recovered plaice however were found in deeper water, as 43 depth informations of the 62 recovered plaice indicate.

water depth (m)	n
<10	1
11-15	3
16-20	4
21-25	23
26-30	11
31-35	1

3/-

These results differ from those of E. Fischer (2) who reported that nearly all plaice remained in the Kiel Bight and hardly any went into the Great and Little Belt or into the Kattegat. He believes that plaice show no tendency to follow the more haline waters of the Great and Little Belt.

Plaice however transplanted from the North Sea into the Belt Sea (Blegvad (1)) seem to stay there as 75.1% of the tagged plaice were caught near the place of release, 22.9% were caught within the region of the Belt Sea. Only 1.7% went into the Kattegat, 0.1% into the North Sea and 0.1% into the Southern and Eastern Baltic.

Growth and ripening of transplanted plaice

Due to the adaption of plaice to the new environment the growth of plaice is rather small during the first months after the tagging. Form June to late autumn the plaice are growing more rapidly(Fig 3), which corresponds with the results of Blegvad (Strodtmann (4)). Most of the plaice being recovered by Danish fishermen were reported to be juvenile (26 ♂, 4♀) after one year. Only 3 ♀ plaice caught in December 1973 (W of Anholt), February (NW of Ärö) and March (SW of Langeland) were reported to be mature.

It is planed for the next occasion to transplant older and ripe plaice from the North Sea into the Kiel Bight in order to study their behaviour and their migration pattern.

Summary

In March 1973 276 young North Sea plaice caught near Helgoland were transplanted into the Kiel Bight. All plaice were tagged and released near Kiel Light vessel. After one year 22.5% of the tagged plaice were recaptured. 87% of the tagged plaice traveled northwards into the Great and Little Belt, in most cases the distance from the place of release was within the 30 nms range. Only few went further North. After one year 3 female plaice were recorded to be mature.

References:
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(1) Blegvad, H.: Transplantations of plaice from the North Sea to the Belt Sea 1928-1933 Report of The Danish Biological Station XXXIX, 1934

(2) Fischer, E.: Ergebnisse der deutschen Verpflanzungsversuche von Nordseeschollen nach der Ostsee Deutsche Fischwirtschaft 1934, p. 419

(3) Rauck, G.: A simple way of tagging flat fish by means of a "tagging gun" ICES, C.M. Demersal Fish (Northern) Committee, F:16. 1-2, 1969

(4) Strodtmann, S.: Die dänischen Schollenverpflanzungen von der Nordsee in die Ostsee. Der Fischmarkt 1936 p. 41

Fig. 1: Length frequency of tagged and transplanted plaice.

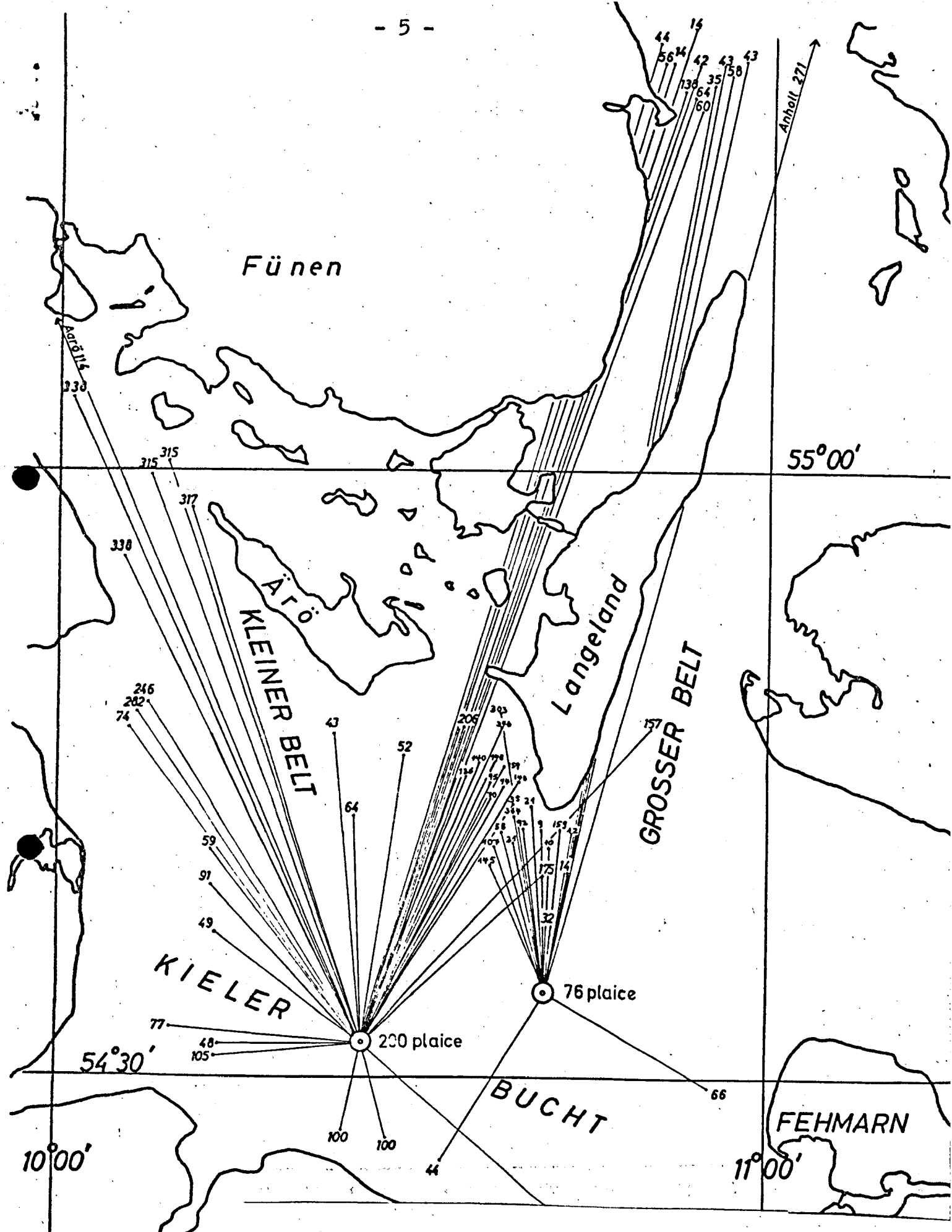

Fig. 2: Transplanted plaice from the North Sea tagged and released at ⊙. Arrows indicating the direction of migration, figures the duration in freedom.

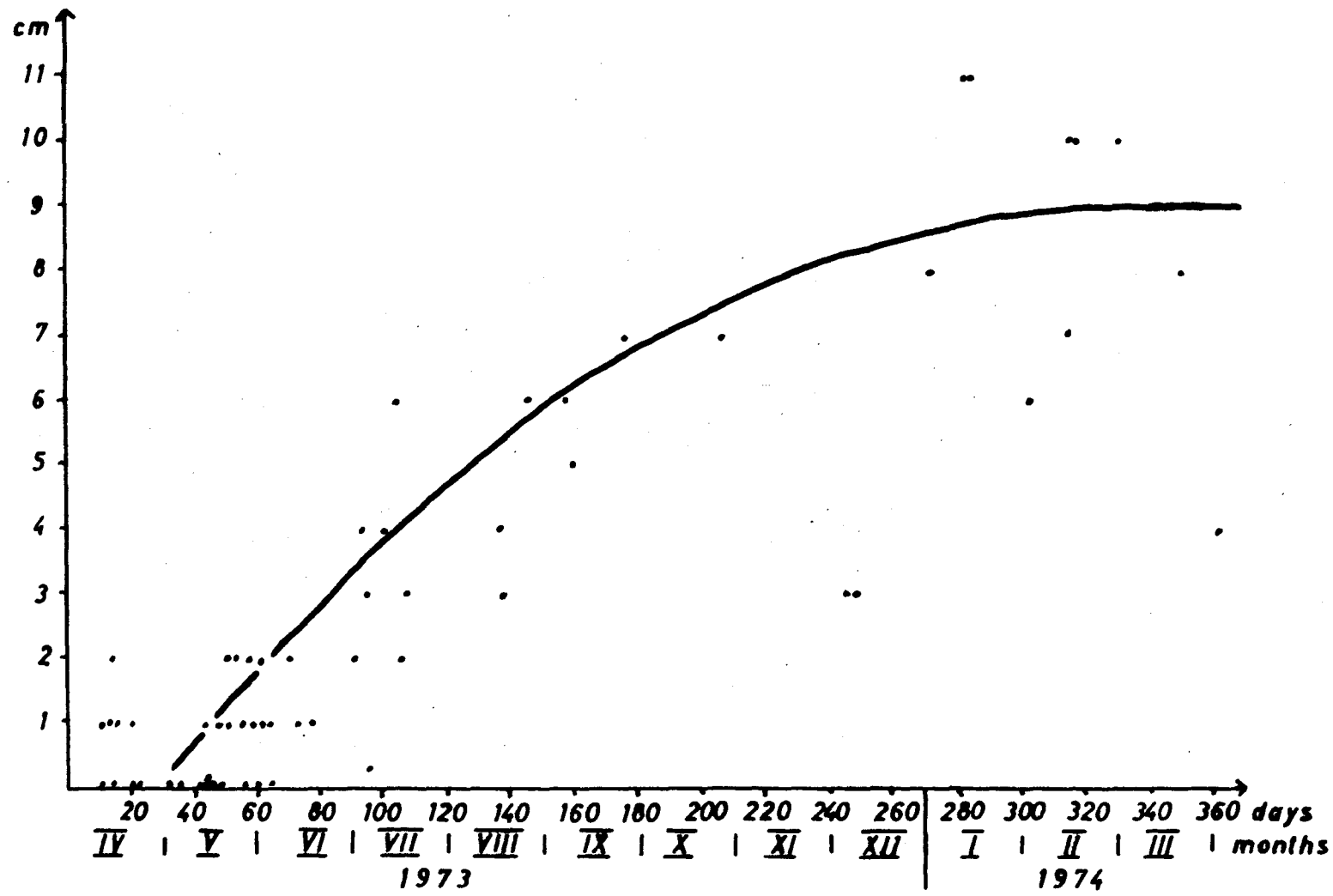

Fig. 3: Growth (cm) of tagged plaice (26., 27. III 1973) after being transplanted from the North Sea into the Kiel Bight.