Summary of Danish Research Work carried out in Subarea I.

by

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Research work in this area dealing with fisheries investigations was carried out as early as 1908-09 when the ship "Tjalfe" under the leadership of professor Adolf Jensen worked in West Greenland waters from 60°00' N.L. to 75°00' N.L. Investigation work including fisheries biology and hydrography was carried out in several fjords, coastal waters and offshore banks.

In 1924 the research work was taken up again and continued in the following years up to the present time. During the years 1940-45 no investigation-ship worked in the area, but material for studies of age-composition in the cod stock and the growth rate of cod was collected by the fisheries officers in Greenland on the instigation of the administration.

Beside the research vessels "Dana I", "Dana II" (in 1925 and 1950) and "Godthåb" (1928) the Danish navy vessels have worked for several years in the subarea especially by collecting hydrographic observations which were carried out from different smaller vessels, in the years 1931-39 from M/B "Umarisok" and from 1946 until now from M/K "Adolf Jensen".

In the following shall be given a survey upon the work which hitherto has been made in Subarea I.

I. Hydrography.

The routine sections across the fishing banks as mentioned in Report No. 1 of the International Commission for the Northwest Atlantic Fisheries, page 42, have been carried out in the summer seasons for several years in the period 1924-51.

In coastal waters and in the different fjords in the whole area many hydrographical stations have been operated in the same period. In some years also content of nutrient salts in the sea have been studied.

Driftbottles were released in West Greenland waters in 1928 and 1939. The observations are published in Bulletin Hydrographique.

II. Plankton.

Macroplankton has been collected almost every year in the area especially for studies of the distribution of fish eggs and larvae. A large material has been collected.

Determination of phytoplankton production was studied locally in 1948.

III. Fishery and Fish Investigation.

a) Cod. Population survey has been carried out by means of otoliths. Age analyses are available for each year since 1924. In all 61,000 otoliths of cod from commercial catches have been collected and analysed as to age, and 5,000 samples of otoliths from young cod (1 - 3 year) taken in seine have been examined in the same period. These investigations have given a good review of the fluctuations of year classes in the stock of cod in Greenland waters during twentyeight years.

From the same material the variations in growth rate and the variations of the age of first maturity have been studied.

From 1924 to 1951 21,294 cod in all have been marked in different localities in the area. Different types of marks have been used. Hardrubber discs fixed in the gillcover have been most commonly used. Distribution of eggs and larvae of cod has been studied by means of hauls with 1- and 2 m. stramin nets.

Meristic characters (numbers of vertebrae and rays in D_2) in cod from different localities in Greenland waters have been counted. 3,300 cod in all have been examined for the sake of comparison with enumerations from localities in American and Icelandic waters.

b) Gadus ogac (fjord cod). Age composition of the stock by means of otoliths of 1,000 specimens has been studied in the years 1934 to 1939. The same material has been used for calculation of the average length of the different year classes. Enumerations of numerical characters have been made on 350 specimens in all from different localities at Greenland. Much more material is collected but not yet dealt with.

Occurrence of the gadoid fishes Saithe and Haddock have been studied and material collected.

c) Halibut. In the years 1935 to 1938 a total of 1,200 otoliths have been collected and determined as to age. Population survey has been made on the material and average sizes of the different age groups have been calculated.

It has been shown that there is some agreement between this species and the stock of cod and Gadus ogac as to good and poor year-classes. In some years small numbers of halibut have been marked, especially in coastal waters and in fjords.

d) Greenland Halibut. The distribution of larvae has been studied by hauls with stramin nets. Young and older fishes have been caught with shrimp trawl and long lines in different

fisheries experiments. A large number of measurements of total lengths of smaller Greenland halibut taken with shrimp trawl have been collected. A total of 1,100 Greenland halibut have been marked in sixteen localities. It has been found that the spawning grounds of the Greenland halibut are situated in the deep southern part of the Davis Strait.

e) Redfish (Sebastes marinus). Distribution of larvae has been studied in the same way as for other fishes. The most important breeding places for the redfish are situated south of Cape Farewell and in the Denmark strait. Only very little breeding takes place in the Davis Strait proper, to which the larvae are transported by the north west going current.

Length measurements of redfish taken in shrimp trawl have been collected.

f) Capelin and charr have been studied by age determinations on otoliths (1,000 Capelins and 800 charrs) which have given information concerning the composition of age groups in different catches, age of first maturity and length of life of the species. A large number of length measurements have been taken of capelin, and number of vertebrae have been counted on more than 800 specimens for racial investigations.

g) Salmon. The Salmon is not a common fish at West Greenland. Spawning places are only recorded in one river in West Greenland. Salmon scales have been collected for studies of age and growth, number of years in freshwater and age when spawning takes place. Fishing experiments with nylon driftlines have been carried out.

h) Herring. Experimental fishing with seine and nets has been carried out in the Sukkertoppen, Frederikshåb and Julianehåb districts. Otoliths and scales have been collected for age-determinations and on a total of about 1,000 specimens number of vertebrae have been counted. It has been shown that the herring in Greenland waters is a summer spawning herring at Iceland.

i) Greenland shark. Commercial fishing experiments have been carried out with long lines. A total of about 400 sharks has been marked in 1936, 1939, 1948 and 1949, and valuable results have been obtained.

j) Seawolf. (Anarhichas minor and lupus). Seawolf fishery is important especially in the northern districts of Greenland. Larvae have been fished for with stramin net and adult specimens have been taken with long lines. While A. lupus was a rather rare fish in previous time it has occurred in increasing numbers during recent years and it is now distributed more northerly than before.

k) Shrimps (Pandalus borealis). The research work on the occurrence of shrimps has been very important. Several rich shrimp beds have been found especially in the Julianehåb district and in the Disko bay in depths of about 400 m. A large material has been collected and examined for studies in age composition of the stock and the growth rate.

About future work in Subarea I a proposed general long-term program is given in the Commission's Report No. 1, page 42.

Changes in the marine fauna in Greenland waters influenced by the climatic change in recent time have been kept under observation. See list of literature.

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Summary of Danish Research Program for Subarea I in 1952.

by

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Research work is planned to be carried out from the two vessels "Dana" and "Adolf Jensen". "Dana" is to work in offshore West Greenland waters in the months of July and August, while "Adolf Jensen" is to make investigations in coastal waters and the fjords from April to October.

A. Investigations in the Davis Strait.

1. Hydrographic work. From "Dana" 7 routine hydrographic sections will be operated over the fishing banks and at the entrance to Disko Bay in July and August. In the early spring it will be tried with "Adolf Jensen" to take hydrographic sections over Fylla bank and Lille Hellefisk bank.

2. Fishing experiments. In the early spring research work will be made in order to find spawning places for cod in the Davis Strait, and occurrence of fish eggs and larvae will be studied by hauls with stramin bag. Cod marking experiments will be made on the fishing banks including the Julianehåb bank and west of Disko island. A material as large as possible of cod otoliths from catches from the banks will be collected for studying age-composition of the stock of cod. The fishing will be carried out with different gears as trawl, longlines, handlines and jigs. Studies upon the occurrence of the three youngest age-groups of cod in the Davis Strait will be carried out by means of fishing with trawl furnished with fine mesh covering of the codend. The occurrence of Greenland halibut and redfish will be studied by trawling experiments in deeper water on the slope of the fishing banks.

B. Investigations in coastal waters and the fjords.

The spawning of cod will be studied on the spawning places in Godthåb fjord and adjacent fjords. Marking experiments with cod will be carried out especially in the southern districts. Collection of otoliths will be continued as usual.

Observations on the occurrence of redfish and Greenland halibut will be made, and fishing experiments with long lines and trawl will be carried out. Marking experiments with Greenland halibut will be tried. Material of otoliths for age determinations will be collected. The occurrence of herring will be studied by fishing with seine and nets. Scale samples of herring will be collected.

Trawling experiments upon deep-sea shrimps will be carried out in different fjords in order to find new shrimp beds.