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Norwegian Research Report
by Erling Bratberg,
Directorate of Fisheries, Institute of Marine Research,
Bergen.

In 1961 two scientific cruises were made to Greenland waters. The cruises were undertaken with the Norwegian research vessel "Johan Hjort".

West Greenland

On the first cruise the main investigated area was between the Nanortalik Bank and the Holsteinsborg Deep (fig. 1), and the working days were between April 12th and May 11th.

Hydrography.

8 hydrographical stations were worked during the days between April 21st and May 8. Temperatures were also registered in connection with all the fishing experiments. The isotherms in some of the sections are shown in fig. 2-5.

The temperatures did not indicate any unusual change in the West Greenland Current. As usual cold water of Arctic origin with temperatures below 2°C covered the tops of the banks, while mixed water of mostly Atlantic origin characterized the water masses on the western slopes below. However, compared with the hydrographical situation at approximately the same time in 1959 and 1960 the temperatures seemed to be somewhat higher in the surface layers in 1961. The comparatively high temperatures in the surface layers may have been due to stirring caused by the wind, but the good ice conditions may also have been a cause.

The drifting ice came unusually late. The Nanortalik Bank and the waters off Julianehaab, which are usually covered with ice from early March, were generally open. Scattered drifting ice was not met with before the northern-most station. Further, heavy pack ice was met with off Søndre Strømfjord in position 66°05'N, 56°05'W.

The high temperatures in the surface layers may, on the other hand, have been caused in part by a heavier inflow of warm Atlantic water in 1961 than at the same time in 1959 and 1960.

Cod investigations.

The fishing experiments showed comparatively good catches in the whole investigated area. Only on one station, situated in the Holsteinsborg Deep, was the catch really poor. Almost all the cod had completed the spawning, but were nevertheless in very good condition, and for a great part the fish were well fitted for Norwegian commercial purposes.

The distribution of the cod on the banks was much the same as in 1960. In some places, however, the mature cod were found in still shallower water than previously at the same time. This was probably caused partly by the good temperature conditions in the upper water layers and partly by migration to the feeding grounds after spawning. The immature cod this year were also found on the tops of some banks where the temperature was relatively low.

The length of the cod varied from bank to bank. The largest fish were caught on the four southern fishing stations and on Lille Hellefisk Bank where the mean length of the cod on the northernmost station was 80.74 cm. The smallest cod were taken on Fylla Bank where the mean length was 73.8 cm. In one long line catch here the mean length was only 55.41 cm. These cod were also the smallest taken without regard to gear.

Fig. 6 and 7 show the length and age composition of the total catch of cod taken on bottom long line. The mean length is 76.27 cm. At the same time last year the mean length was only 73.27 cm. In Divisions 1B, 1C, 1D, 1E and 1F the mean lengths were in April 74.01, 77.69, 73.74, 78.06 and 76.31 cm respectively. Samples were also taken from Divisions 1D and 1F in May. The mean lengths were then 73.76 and 77.46 cm. The increase in the overall mean length must for the greatest part be due to the growth of the 1953 year-class which constitutes 37.21% of the total long line catch and has a mean length of more than 77 cm. On the other hand the percentage of fish more than 9 years old has increased since last year, and these fish are of course also playing a great part in the mean length increase.

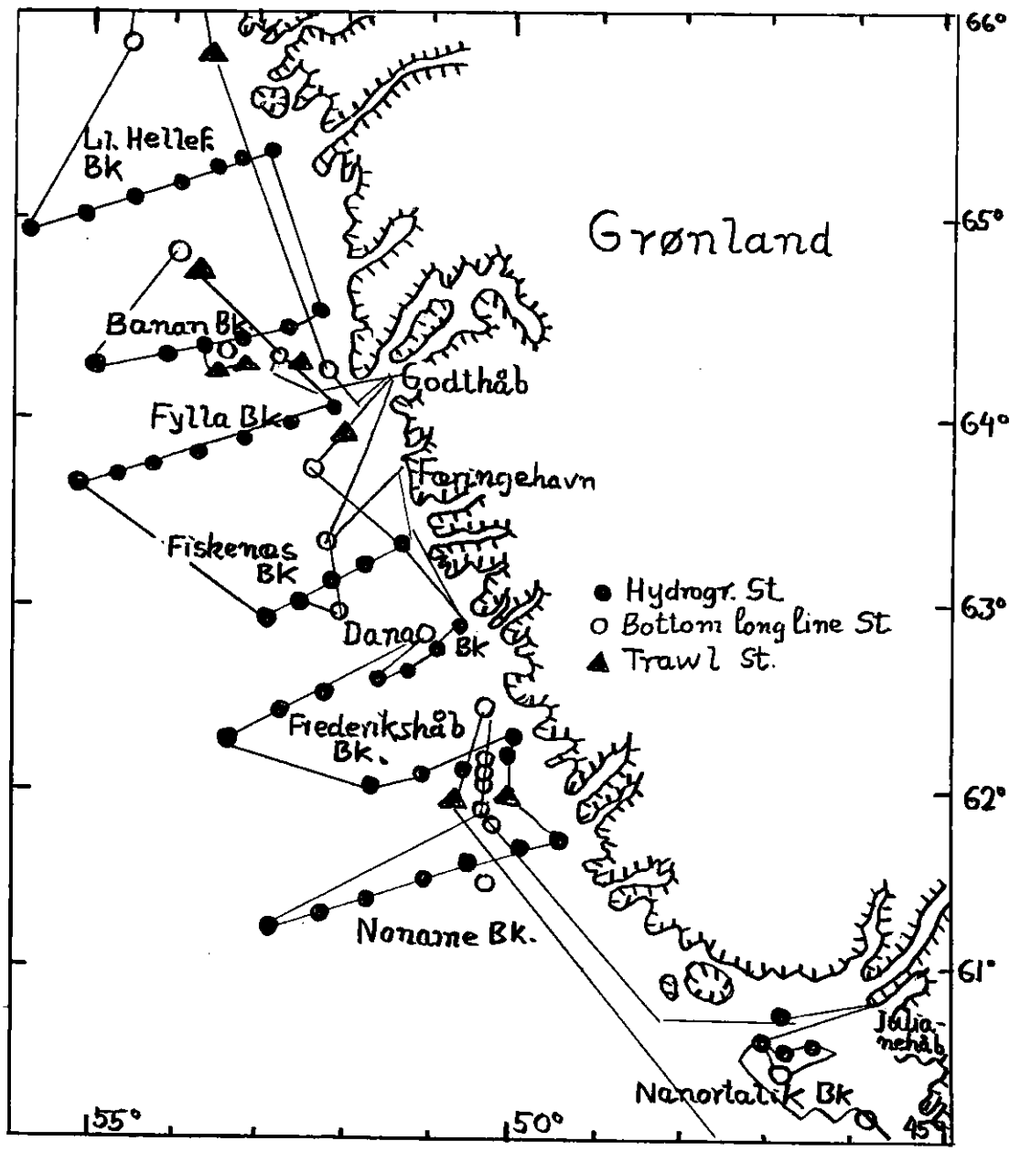

Fig. 1 : "Johan Hjort", West Greenland April-May 1961.
Routes and stations.

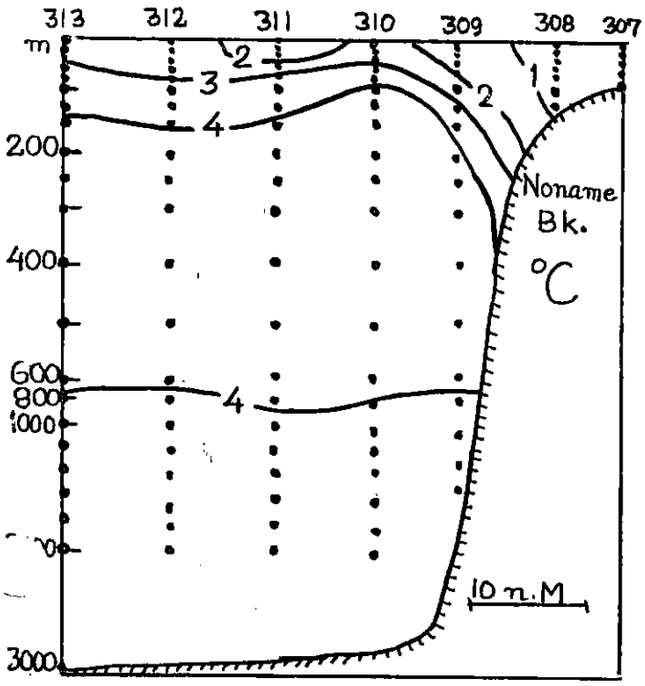

Fig. 2 : "Johan Hjort", West Greenland April-May 1961. Temperature section from Noname Bank and westward.

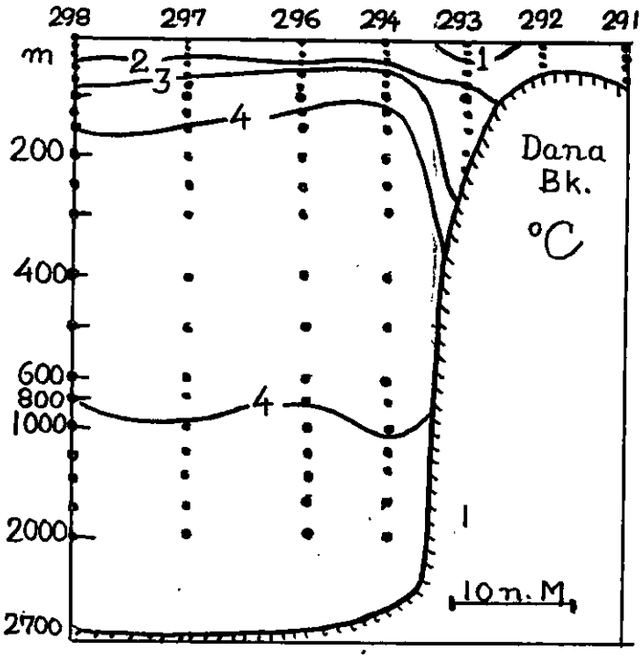

Fig. 3 : "Johan Hjort", West Greenland April-May 1961. Temperature section from Dana Bank and westward.

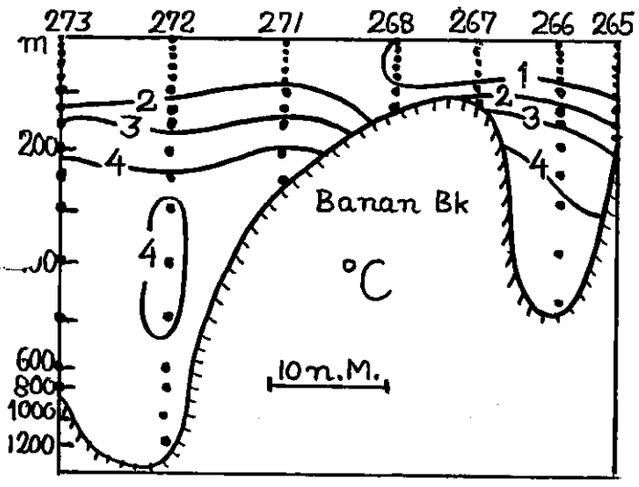

Fig. 4: "Johan Hjort", West Greenland April-May 1961. Temperature section from Banan Bank and westward.

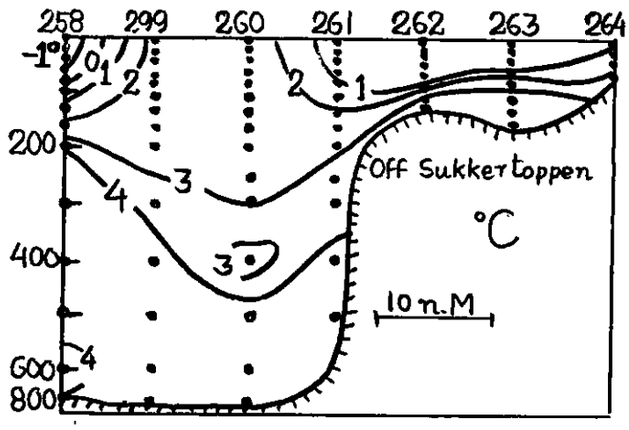

Fig. 5 : "Johan Hjort", West Greenland April-May 1961. Temperature section from Sukkertoppen and westward.

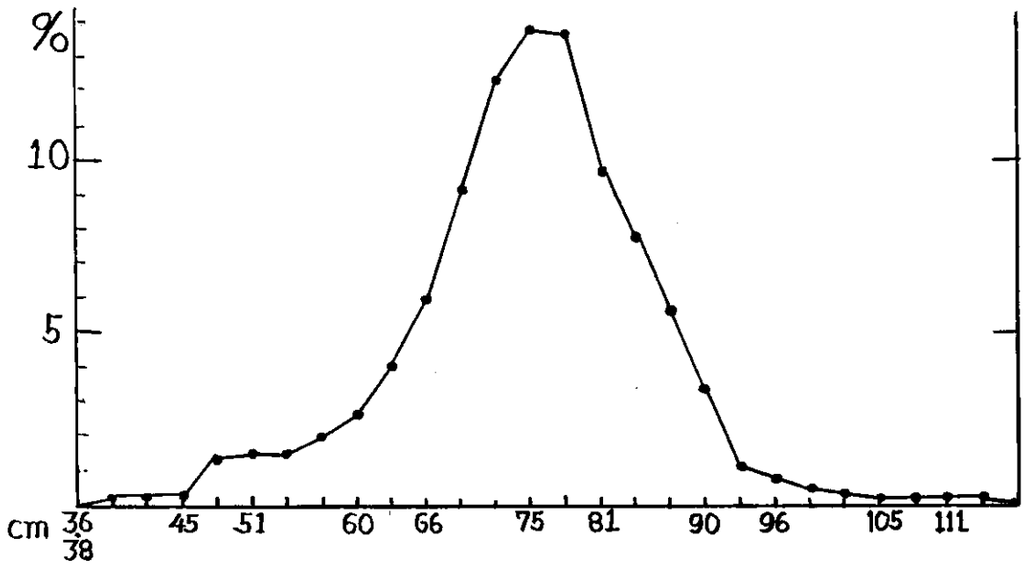

Fig: 6 : "Johan Hjort", West Greenland, April-May 1961.
Cod, length composition. Total bottom long line catch.

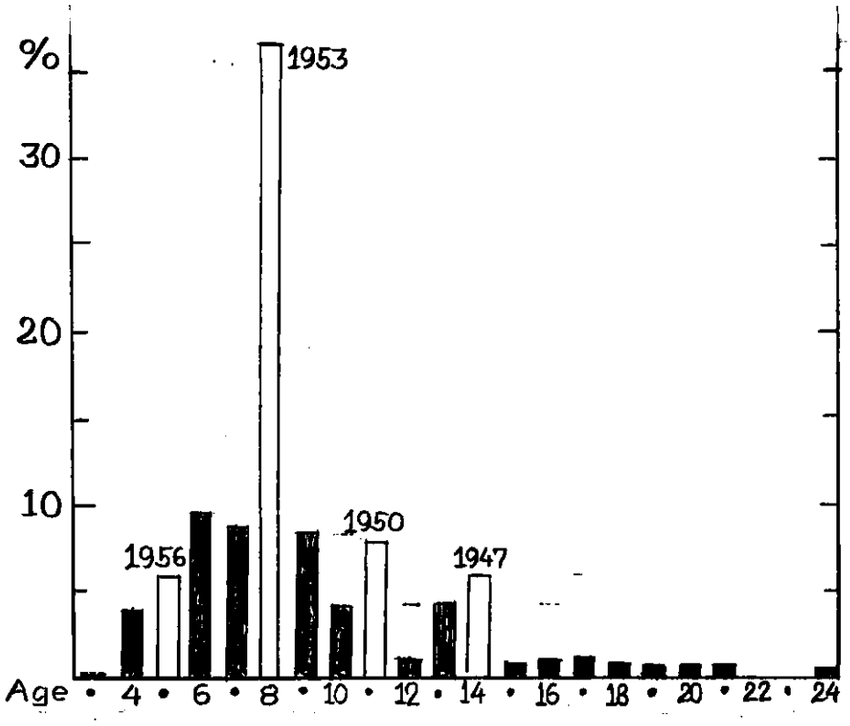

Fig. 7 : "Johan Hjort", West Greenland, April-May 1961.
Cod, age composition. Total bottom long line catch.

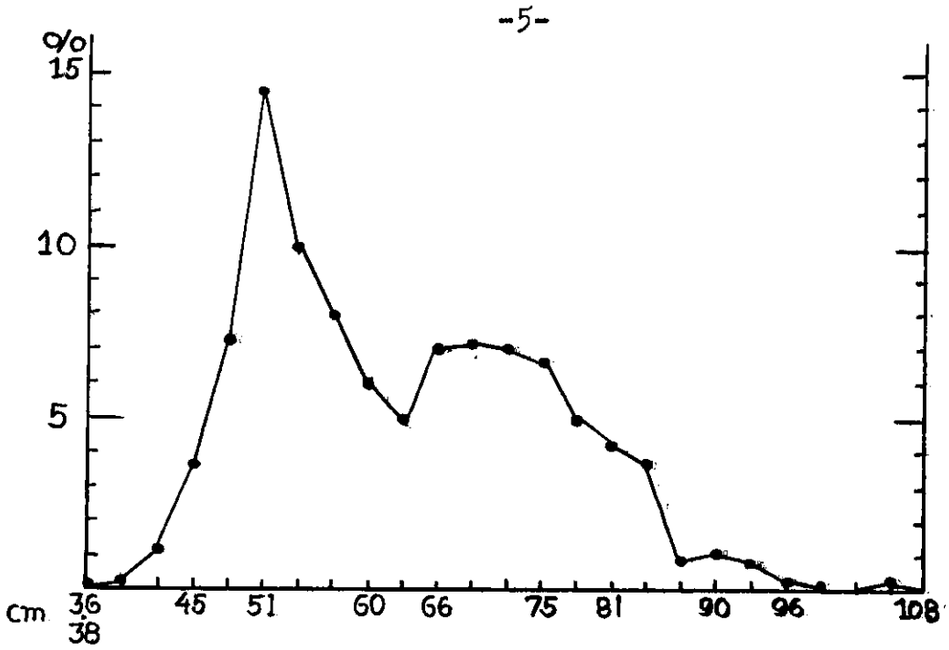

Fig. 8 : "Johan Hjort", West Greenland, April-May 1961.
Cod, length composition. Total trawl catch.

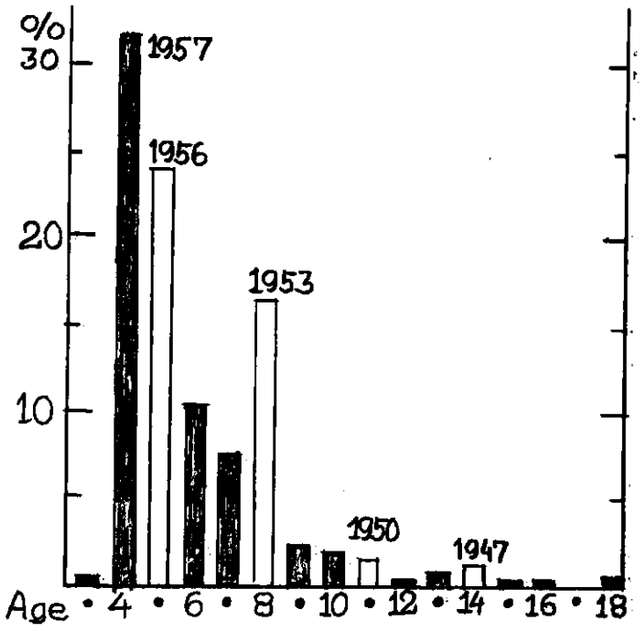

Fig. 9 : "Johan Hjort", West Greenland, April-May 1961.
Cod, age composition. Total trawl catch.

The increase in the mean length could suggest a lack in the recruitment to the long line fishery, but such an interpretation is probably incorrect. The long line catch is not representative for the cod population as here only the mature part of the stock is fished.

In figures 8 and 9 are shown the length and age composition of the cod in the total trawl catch. Compared with the bottom long line catch the trawl catch is dominated by small fish. For a great part the cod in the trawl catches are immature, and the sampled material from these catches is thus not representative for the West Greenland cod population. The material, however, may give a hint regarding the recruitment to the long line fishery.

Compared with the trawl catch in 1960 there is again a strong 4 year old group, but not as dominant as last year. The loss of dominance of the 4 year old fish in 1961 is probably due to the 1956 year-class. As 4 year olds last year this year-class was promising, and now the year-class seems to confirm this. In other words, probably the 1956 year-class will be a strong one and give good recruitment to the cod long line fishery in the next years.

The 1947 and 1950 year-classes will probably in 1962 play a very little part in the West Greenland cod long line fishery. The 1953 year-class will be dominant, but its importance seems to be decreasing. The mean length of cod caught on long lines may remain much the same as in 1961, but this depends on the influence of the 1956 year-class. If the influence of this year-class is going to be strong, we may have a slight decrease in the mean length of the cod in the bottom long line catches.

Halibut investigations.

Attempts were made on 4 localities with halibut long line, but only 14 halibut were caught. The bycatch of halibut on the cod bottom long line was better. The total catch was 122 halibut. Also this year the halibut were rather small and immature. Fifty-four halibut were tagged, and as usual the tag was a yellow plastic disk in the gill cover.

East Greenland.

The second cruise in 1961 was to East Greenland waters. Here the area between Cape Farewell and Cape Dan was visited on the days from August 23rd to September 12th (fig. 10).

Hydrography.

Between August 24th and September 5th 3 hydrographical sections were worked. Temperature registrations by means of a bathythermograph were made on 17 other localities, most of them in connection with the fishing experiments. The temperatures in the sections are shown in fig. 11-13.

Compared with 1959 the water seems to be warmer in 1961, especially in the Arctic component of the East Greenland Current. Only at Cape Dan were temperatures below 1°C, recorded. The Arctic component of the current seemed also not to be so heavy as in 1959. The comparative warmer temperatures may to some degree be due to the very good ice conditions at that time. Between Cape Farewell and Cape Dan there was no drifting ice before the 5th of September. At that time drifting ice came from the northeast into the area off Cape Dan. In addition, the warmer temperatures must have been caused partly by a heavier influx of Atlantic water from the Irminger Current.

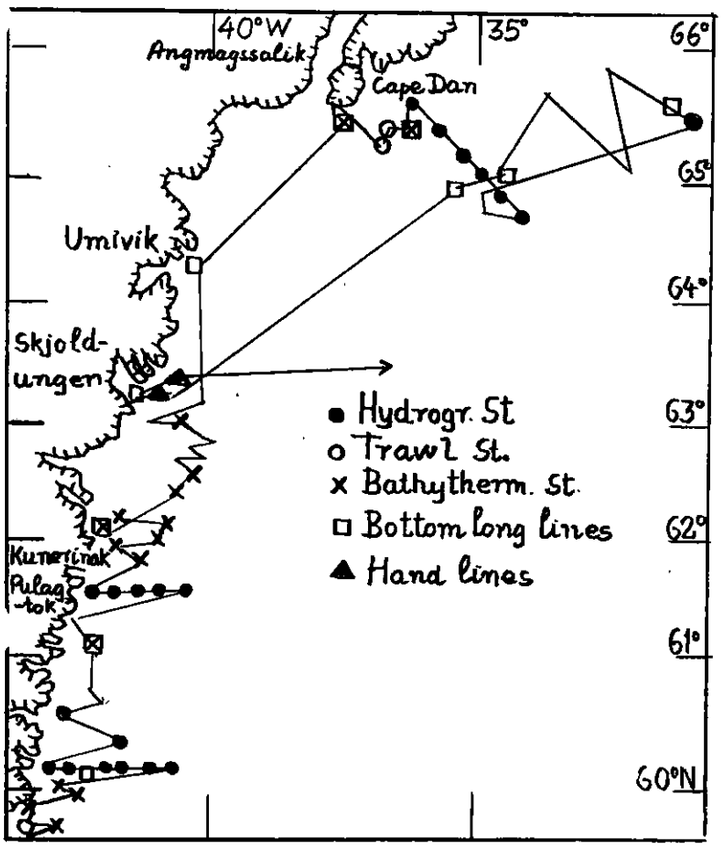

Fig. 10 : "Johan Hjort", East Greenland, August-September 1961. Routes and stations.

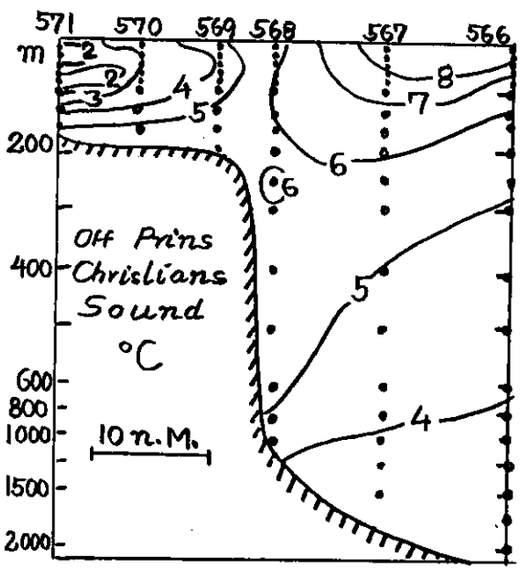

Fig. 11 : "Johan Hjort", East Greenland, August-September 1961. Temperature section from Prins Christian Sund and eastward.

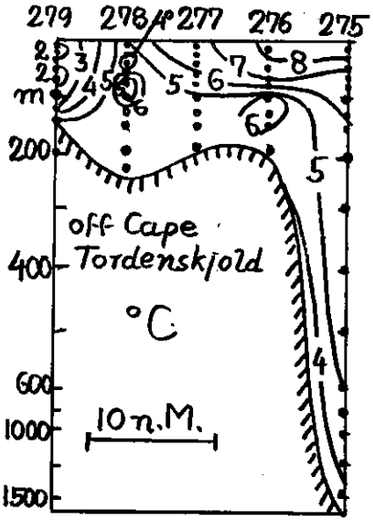

Fig: 12 : "Johan Hjort", East Greenland, August-September 1961. Temperature section from Kunerinak (Cape Tordenskjold) and eastward.

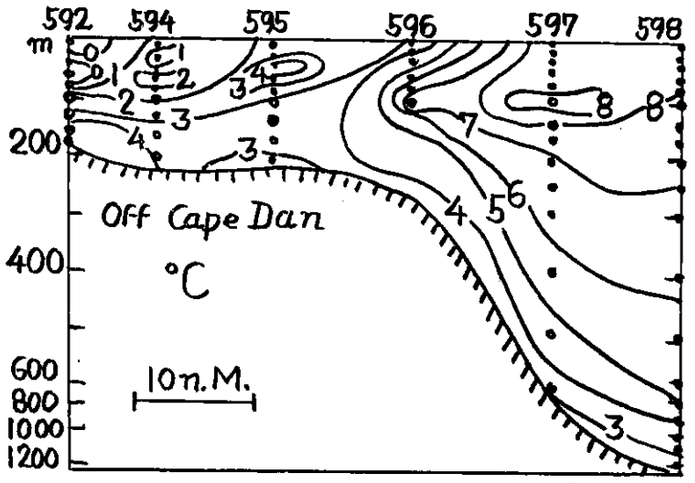

Fig. 13 : "Johan Hjort", East Greenland, August-September 1961. Temperature section from Cape Dan and southeastward.

Cod investigations.

The fishing experiments showed this year no localities where cod were completely absent, but compared with 1959 the catches on bottom long line off the coast were rather poor. Only off Cape Dan, about 5 n. miles offshore, the catch was really good. In Skjoldungen very good catches were obtained by hand line.

In fig. 14-17 are shown the length and age composition of the cod in the total catches on bottom long line and on hand line. The mean length of the cod caught on bottom long line is 85.9 cm, nearly the same as in 1959 (86.1 cm). The largest cod were found off Cape Dan. Here the mean length was 93.4 cm. The cod which were caught on hand line had a smaller mean length. In the South- and Northfjord in Skjoldungen the mean lengths were 74.2 and 80.3 cm respectively. All the cod were in very good condition and had for a great part a satisfactory size for Norwegian commercial purposes.

The 1953 year-class is dominant and the 1950 year-class has comparatively the same strength in the catch both on long line and hand line. On the other hand there is a slight difference in the age composition. In the long line catch the 1947 year-class plays a relatively great part and is a reason for the high value in the mean length. The 1947 year-class is much weaker in the hand line catch. Here the 1956 year-class is comparatively strong and seems to be promising for the recruitment to the long line fishery for the next years.

From the investigations in East Greenland waters in 1959 and 1961 it seems safe to conclude that a combined cod bottom long line and hand line fishery might be profitable. During the beginning of the season, from the middle of June to the middle of August, cod are found partly in pelagic shoals on the banks off the whole coast from Cape Farewell to Angmagssalik. Later in the season the fish move into some of the fjords where they feed on capelin and the fry of capelin. In the Angmagssalik fjord and the North-and Southfjord in Skjoldungen the conditions are of such a nature that the cod move nearly unfailingly into these fjords.

Halibut investigations.

Ninety-one halibut were caught on halibut and cod bottom long line. The biggest catch, 36 halibut was taken about 5 n. miles off Cape Dan. The mean length in the total halibut catch was 89.1 cm. All the halibut were in good condition, and in part they had an adequate size for Norwegian commercial needs.

Tagging experiments.

The tagging experiments which were started in 1959 in East Greenland waters, were continued. A total of 397 cod were tagged. This year only 21 cod were tagged on the Cape Dan Bank. The others were tagged in the North- and Southfjord in Skjoldungen. Both Lea tags and yellow plastic disks were used. In addition 35 halibut were tagged with yellow plastic disks.

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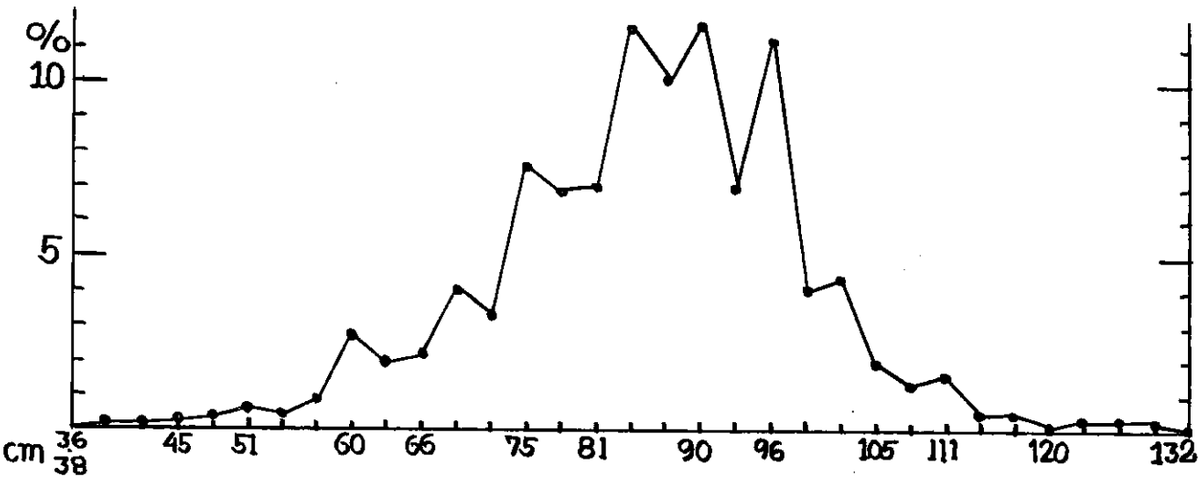

Fig. 14 : "Johan Hjort", East Greenland, August-September 1961.
Cod, length composition. Total bottom long line catch.

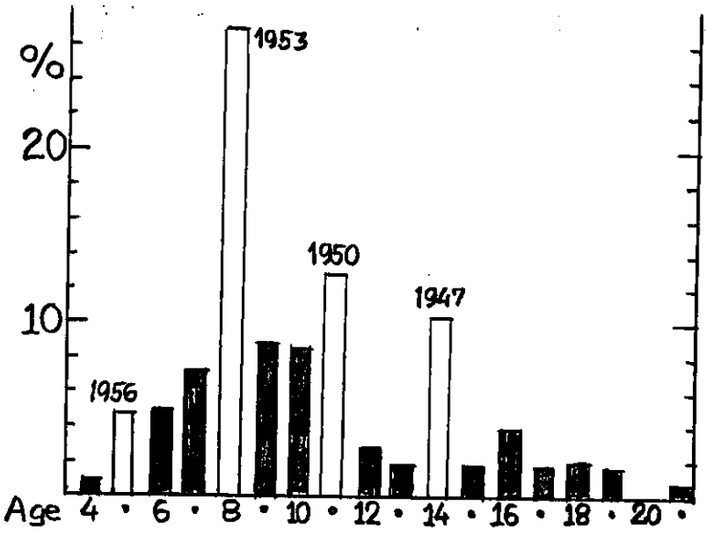

Fig. 15 : "Johan Hjort", East Greenland, August-September 1961.
Cod, age composition. Total bottom long line catch.

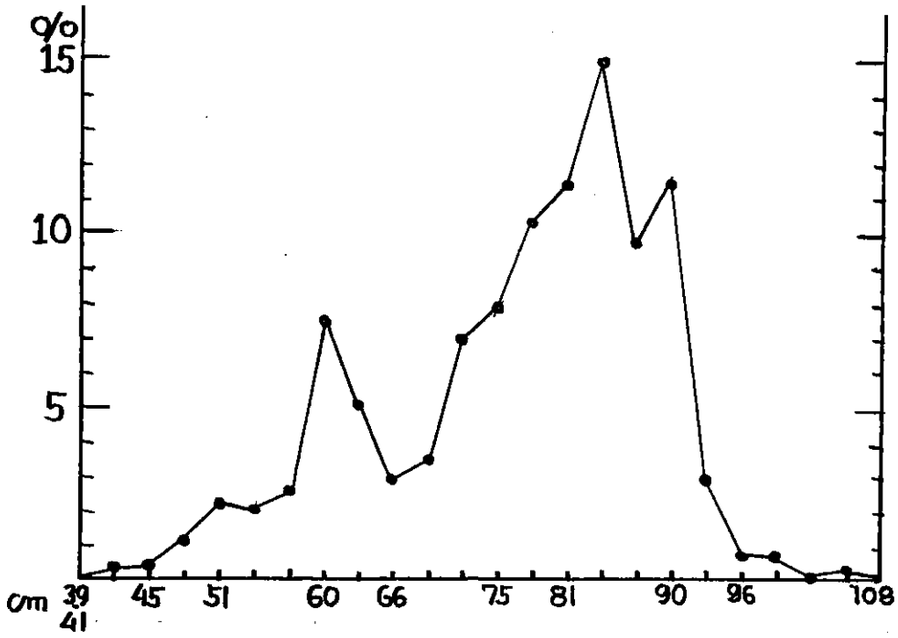

Fig. 16 : "Johan Hjort", East Greenland, August-September 1961.
Cod, length composition. Total hand line catch.

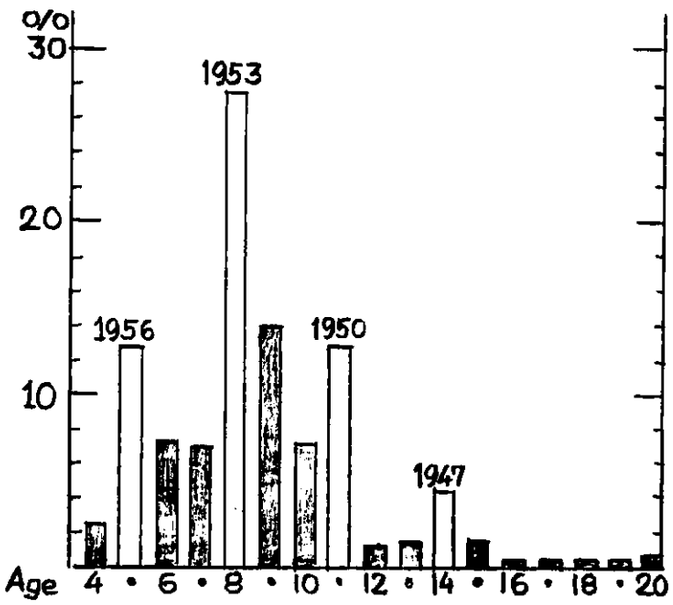

Fig. 17 : "Johan Hjort", East Greenland, August-September 1961.
Cod, age composition. Total hand line catch.