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Some changes in the stock of cod
/Gadus morhua L./ of Labrador and
Newfoundland Area in 1970

by

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1. Polish catches

The landings of cod by Polish fishing fleet from ICNAF Area amounted to 49,730 tons in 1970. In the years 1966 - 1969 they were respectively 36,446, 57,663, 91,008 and 76,680 tons. In 1970 there was noted a decrease of cod landings by 35.2 % in comparison to the year 1969 and by 45.4 % in comparison to the year 1968. Some more detailed data characterizing these changes are given in the Table 1

In 1970 Polish fishing fleet operated mainly in the region of Southern Labrador /Div.2J/ and in lesser extent also in the region of Northeast Shelf of Newfoundland /Div. 3K/ and in the region of Central Labrador /Div.2H/.

Table 1

Polish landings of cod /in tons/ from particular divisions of Labrador and Newfoundland in the years 1966 - 1970

Divisions	Years				
	1966	1967	1968	1969	1970
2G	-	1,039	925	1,149	-
2H	11,884	8,504	17,519	14,704	5,675
2J	17,865	28,592	51,301	48,310	30,675
3K	4,454	5,359	16,682	13,303	12,340
3L	305	5,849	1,004	78	194
3M	93	4,152	71	-	53
3N	613	3,255	6	-	-
3O	152	290	-	193	-
3P	9	-	-	-	-

In 1970 in all the fishings grounds of Labrador the catches of cod decreased as compared to previous years. No fishings operations were conducted in Div. 2G because of prevailing ice conditions. Ice floes also impeded fishing in Div. 2H. The landings of cod from this region dropped from 14,704 tons in 1969 to 5,675 tons in 1970. In Div. 2J the catches dropped from 48,310 tons to 30,675 tons.

In the fishing grounds of Newfoundland Polish fishing fleet operated in a rather small extent. The catches were carried out mainly in Div. 3K. Also here the landings of cod dropped, though the decrease was not as great - from 13,303 tons in 1969 to 12,340 tons in 1970. In other regions /Div. 3L and 3M/ the catches by Polish fleet slightly increased.

2. Catch per unit effort

For the assessment of stock it might be useful to follow the changes in catch and fishing effort. The changes were rather considerable which may be seen from the figures in the Table 2

Table 2

Catch per effort /in kg/h/ obtained by Polish trawlers fishing cod in the first halves of the years 1966 - 1970

Divisions	Years				
	1966	1967	1968	1968	1970
2H	3,961	2,358	4,346	2,725	1,768
2J	2,813	2,301	3,502	3,095	2,353
3K	543	491	1,163	1,013	644

In the fishing grounds of Labrador a large decrease of catch per effort in cod fisheries is noted already since 1968. In 1970 the yield in Div. 2H was two and a half times less as compared to 1968, whereas the abundance of cod was undoubtedly better in Div. 2J since the yield here dropped only one-and-half times.

In Div. 3K a great decrease of fishing yield is noted only after 1968. It is nearly twofold in the period 1968-1970.

3. The abundance and stock composition of cod

To follow the changes in the abundance of cod into consideration was taken the number of fish caught per one hour. Also their length-classes and age groups were studied /Figures 1 and 2/.

In Div. 2J the number of cod caught in one hour with bottom trawl was as follows: in 1963 on average 3,734 individuals; in 1960 - 2,299 and in 1970 - only 1,626.

In Div. 3K the difference in the number of cod caught per one hour in the years 1963 and 1970 was not so great. Most probably the decrease of the abundance of cod here took a slower rate. In 1963 an average number of cod caught per one hour was 1,548 and in 1970 - 1.264 individuals.

Particular attention is worth the reduction of these age - groups of cod which in previous years made the basis of catches. In Divisions 2J and 3K they were fish 5,6 and 7 years old.

In Div. 2J the number of fish of these age-groups in succession for the years 1963, 1969 and 1970 were as follows:

	1963	1969	1970
5 years old fish	572	158	481
6 years old fish	1,356	635	286
7 years old fish	862	571	312

In Div. 3K the number of 5, 6 and 7 years old fish caught per 1 hour trawling in the years 1963 and 1967 was as follows

	1963	1970
5 years old fish	454	289
6 years old fish	444	370
7 years old fish	234	280

When comparing the curves in the Fig. 1 we may see that in 1970 in Div. 2J not only less fish were caught per 1 h trawling, but also that the fish were considerably smaller and younger. We also see that in the catches in 1963 and 1969 occurred analogical length-classes and age-groups, mainly fish of the length 45 to 65 cm and in the age of 6 and 7 years,

In the catches in 1970 there was a considerable participation of fish in the length 24 to 45 cm in the age of 3 to 5 years. Undoubtedly older age-groups had been reduced in Div.2J.

In Div. 3K cod caught in 1970 were of similar length-classes and age-groups as in 1963 though with higher frequency of smaller fish.

Both in Div. 2J and in Div. 3K was noted an apparent disappearance of older year-classes of cod in the catches in 1970. The oldest fish caught this year in winter period in Div. 2J were 15 years old, and in Div. 3K - 14 years /whereas in previous years the cod in the catches reached even the age of 20 years /E.Stanek,1969/ /.

On the basis of age composition of cod in commercial catches /E.Stanek, 1969/ we may conclude that in the stock of Labrador and Newfoundland Area the abundant year-classes were those of 1961, 1962, 1963 and 1966. Also abundant seems to be the year-class 1967 and particularly the 1968 year-class. A.Yn.Bulatova /1970/ pointed to good abundance of the year-classes 1966 and 1967, which was above an average. The 1964 year-class is comparatively of poor abundance while the year-class 1965, though considered to be poor one /ICNAF Comm. Doc.71/1, 1971/, was of a considerable importance in Polish Catches in 1970. As the result of very intensive fishing the cod year-classes 1965 and 1966 had been considerably reduced before their recruitment was completed.

4. The tendency in fisheries

Steadily increasing intensity of exploitation of cod in the fishing grounds of Labrador and Newfoundland resulted in the reduction of stocks of this species. This revealed itself at first in the decrease of fishing yield noted since 1969 and then - in 1970 - in changes in length and age composition of caught cod.

Smaller and younger fish in the catches along with a decrease of catch per unit effort present a clear indication of a strong effect of fishing upon the stock.

The young year-classes of cod owing to intensive fishing actually become in an earlier stage the object of fisheries and are subject to a considerable reduction before recruitment

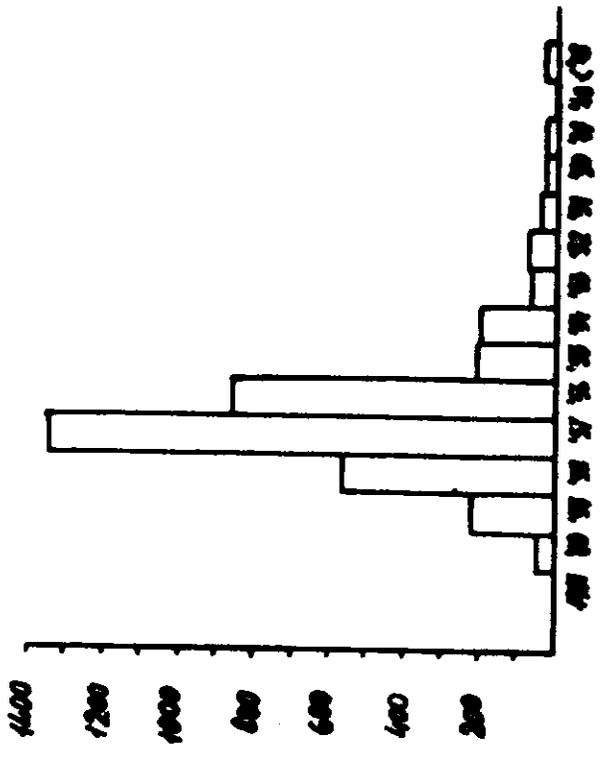
into commercial stock. Thus young year-classes, reduced in abundance /the year-classes 1967 and 1968/, will not ensure sufficient recruitment into commercial stock in the nearest future, while the abundant 1966 year-class will be considerably reduced by this time. Also the abundant year-classes 1961, 1962 and 1963 will be no more of importance for the catches.

It should be supposed therefore that in the fishing grounds of Labrador and Newfoundland both the catches and fishing yields with actual amount of fishing effort by various fleets shall not increase. The increase of the amount of fishing effort will still more reduce the resources of cod and decrease the effectiveness of fisheries. We should have in view the possibility of a short term increase of fishing yields in pre- and spawning period owing to lowering of the temperature of aquatic environment, but this would result in further reduction of cod resources.

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No. fish per h.



No. fish per h.

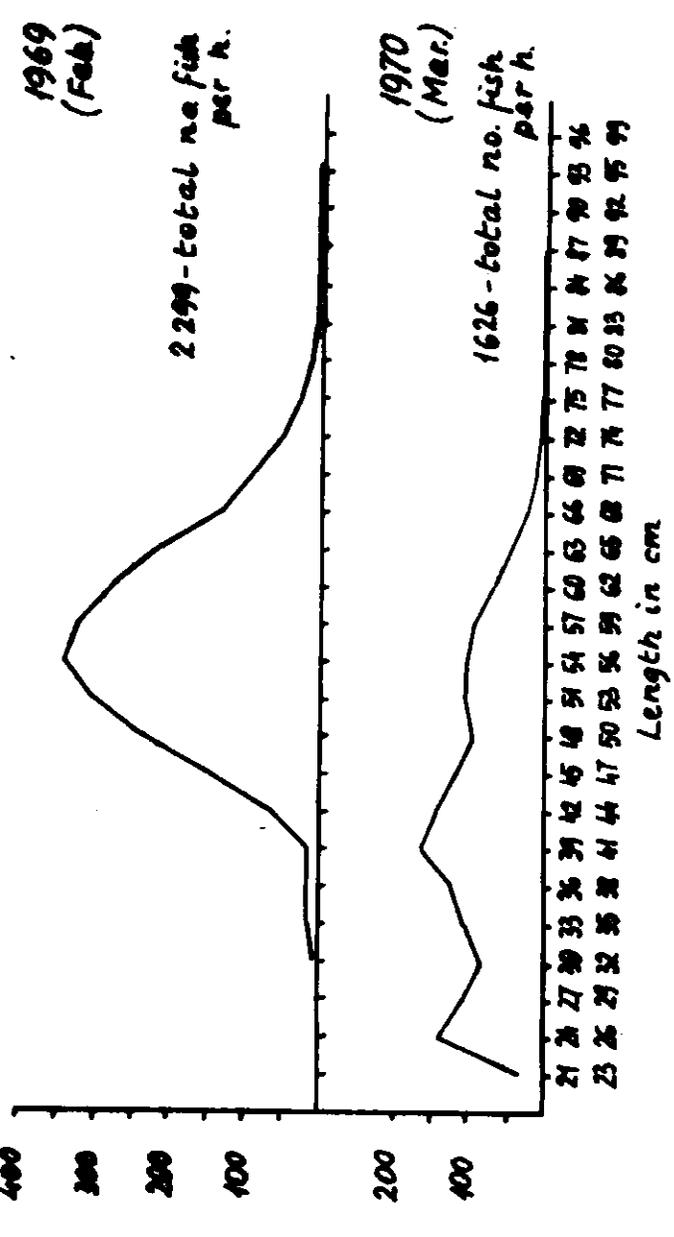
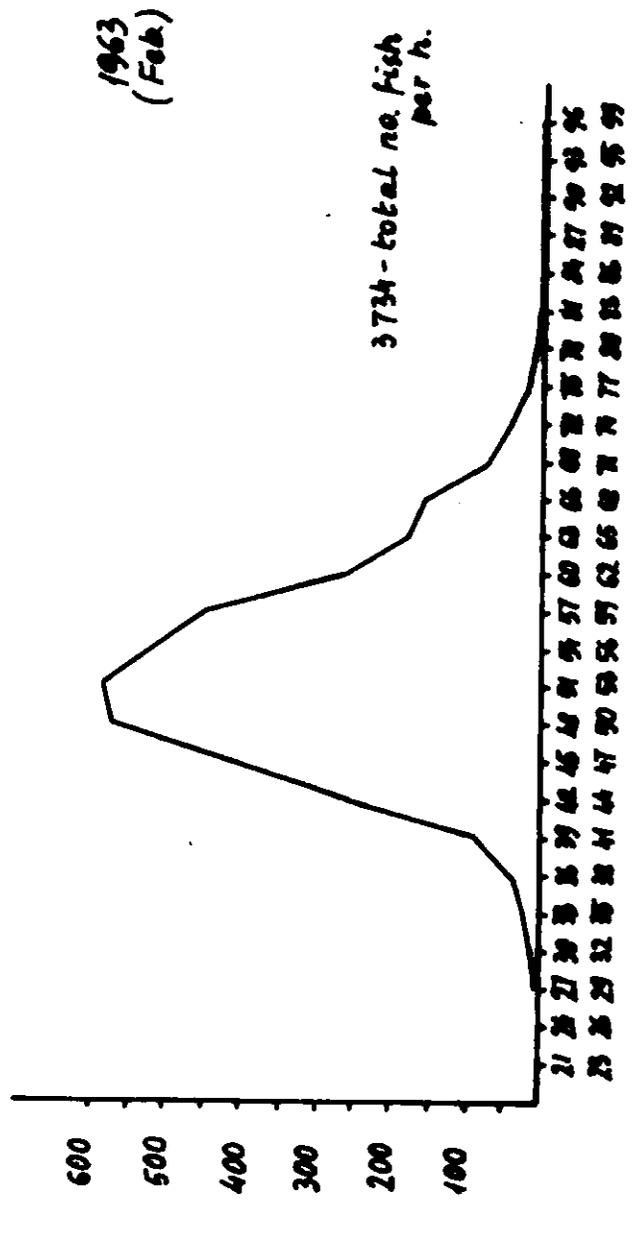


Fig. 1 Length and age composition of ood catch taken per 1 hour trawling in Div. 2J

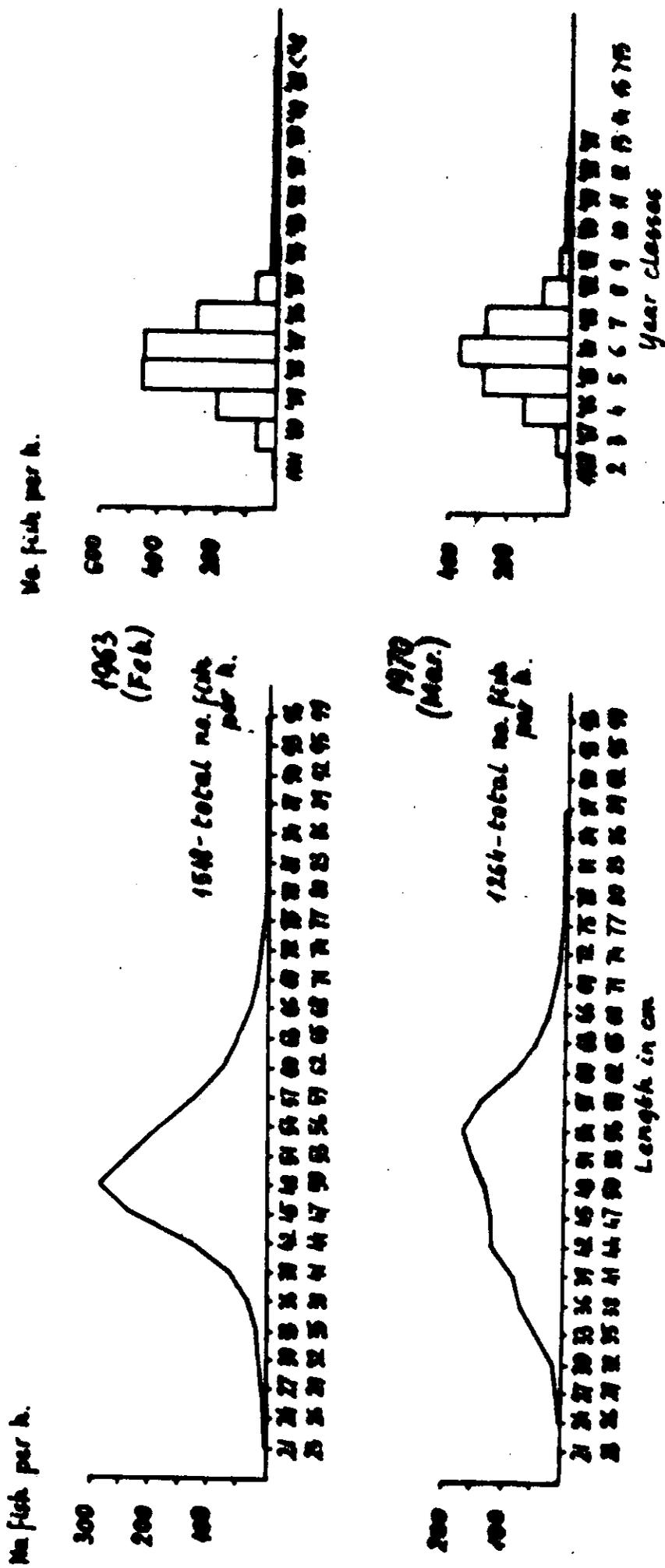


FIG. 2 Length and age composition of cod catch taken per 1 hour trawling in Div. 2B