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The state of cod stocks in the Labrador (Div.2J) and
Newfoundland (Div.30) areas in 1971 and the fishery forecast for 1972

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Labrador Area

In 1970 the cod catches in the Labrador area consisted partly of the fish of the 1962-1965 year-classes which are considered to be above average in abundance. However, there was a slight decrease in the catches in 1970 and a bigger decrease in 1971 (Table 1).

Table 1. Mean catch of bottom fish per unit effort in the South Labrador area in January-June.

Year of catch	Mean catch in tons	
	per hour trawling	per day fished
1960	2.97	43.6
1961	2.87	39.9
1962	3.02	41.2
1963	3.80	49.4
1964	3.79	50.3
1965	3.38	46.0
1966	3.34	50.5
1967	2.41	32.0
1968	3.83	44.2
1969	3.02	39.8
1970	2.73	36.3
1971	1.97	28.6

The observed decrease in catches, particularly in 1971, may be explained by the varying abundance of year-classes. It has been shown that the rich year-classes may be 3-4 times as abundant as the poor ones. It has also been observed that "rich" and "poor" years alternate with a certain periodicity: a succession of "rich" years is followed by a succession of "poor" years. This is related to periodic fluctuations in oceanological conditions. After a succession of several "rich" years the abundance and the biomass of the commercial stock become greater.

For example, according to the young cod survey data the abundance of the 1961, 1962 and 1963 year-classes was fairly high (Table 2). When cod belonging to these year-classes reached commercial size (1968-1969) better catches were obtained (Table 1). In 1970 the abundance and the biomass of the commercial stock decreased due to the recruitment of the relatively poor 1964 year-class. The low abundance of the 1965 year-class (Table 2) has made the situation even worse.

Table 2 shows that the number of 3-year-olds of the 1966, 1967 and 1968 year-classes is several times greater than that of the poorest 1964 year-class. Therefore, by 1972, and certainly by 1973, good recruitment to the commercial cod stock may be expected. In 1972 the abundance of the Labrador cod is expected to be higher than in the preceding two years as the two good year-classes (1966 and 1967) are recruited to the commercial stock at the age of 5-6 years. The 1968 year-class is also believed to be abundant but these fish will in 1972 be too small to make a contribution to the fishery.

Table 2. Data from the young Labrador cod survey.

Year-class	Mean number of 3-year-olds per hour trawling
1959	21
1960	11
1961	20
1962	15
1963	36
1964	8
1965	15
1966	27
1967	32
1968	40

In 1972 the proportion of the younger age-groups will be higher and that of the older age-groups (7- and 8-year-olds) lower than in the preceding years. The fishery in the Labrador area will not be stabilized before mid-January. The rather late formation of the pre-spawning commercial concentrations in 1972 will be conditioned by the predominance of young cod in the Labrador stock. Bigger fish are usually the first to arrive in the wintering, spawning and feeding areas. As the bigger cod are now relatively scarce in the Labrador stock, the fishery is likely to be only occasional before mid-January.

Table 3. Percentage age-composition of the Labrador cod (January-March).

Year of catch	Age														
	3	4	5	6	7	8	9	10	11	12	13	14	15+		
1968	0.2	2.1	21.0	20.5	19.6	16.4	8.9	4.2	3.1	2.9	0.4	0.4	0.3		
1969	0.2	3.0	14.7	30.1	22.0	15.1	6.8	3.2	0.9	1.9	1.4	0.2	0.5		
1970	4.4	6.5	16.4	18.2	15.9	16.2	9.2	5.7	2.9	1.9	0.9	0.8	1.0		
1971	-	12.0	15.0	25.0	20.8	12.7	8.1	3.8	0.9	0.7	0.7	0.2	0.1		

A further contribution to the expected increase in the cod fishery in the Labrador area in 1972 will be made by the following two factors:

- increasing negative anomalies of the water temperature over the shelf and the continental slope of Labrador will force cod to pass to deeper water layers, which will result in denser commercial concentrations;
- in the earlier half of 1971, especially in February and March, the ice conditions in the Labrador area were very severe, which restricted the cod fisheries.

However, the steadily increasing removal of the Labrador cod by fishing results in a progressive decrease of the mean age, length and weight of the fish, which will somewhat diminish the expected increase in production.

Newfoundland Area

The cod found on the southern Grand Bank differ from the Labrador cod in their faster growth rate, larger size, otolith structure and some other characters. Systematic young fish surveys and the analysis of the size and age-composition of catches show that the Newfoundland cod is characterized by sharp fluctuations in the abundance of year-classes. The eggs, larvae and young fish develop in the area with variable hydrographic conditions. The southern slope of Grand Bank is under the influence of both the warm Gulf Stream Current and two branches of the cold Labrador Current, their interplay being responsible for sharp hydrological contrasts.

The main spawning grounds are on the southwestern slope of Grand Bank and

in June spawning concentrations are fished in this area.

At present the stock of the Newfoundland cod has somewhat decreased as a result of heavy fishing in recent years and of recruitment of the very poor 1967 year-class. However by 1972, the stock is expected to increase due to the appearance of a rather good year-class on Grand Bank in 1968. At the age of 4 years these fish will reach a length of 50 cm and a weight of about 1 kg.

During almost the entire past decade the abundance of the Grand Bank haddock remained at a very low level. By 1972 not one good year-class will be recruited to the haddock stock. Haddock will only be caught incidentally in cod and flounder fisheries. An indication of the size of recruitment is provided in Table 4 which shows the results of the quantitative young haddock survey.

Table 4. Mean numbers of young haddock caught per hour trawling (research survey vessels only).

Year-class	Age					
	1		2		3	
	Div. 30	Div. 3P	Div. 30	Div. 3P	Div. 30	Div. 3P
1963	-	-	-	-	2	17
1964	-	-	4	55	6	153
1965	1	13	1	41	1	4
1966	3	110	8	191	1	20
1967	1	183	1	16	1	2
1968	4	25	8	10	-	-
1969	4	35	-	-	-	-