

ANNUAL MEETING - JUNE 1966Size, age and sexual maturity of American plaice (*Hippoglossoides platessoides*)
from fishing grounds off Newfoundland and Nova Scotia, Spring 1965

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Introduction

Materials relating to American plaice were collected from 14 April to 7 June 1965 during the research cruise of M/T *Wieczno* to the Newfoundland (Divisions 3L, 3M, 3N, 3O, 3P) and Nova Scotia (Divisions 4W, 4V) fishing grounds.

Fish samples were taken from the catches in order to investigate the selectivity of bottom trawls with the mesh size of the primary netting of their codends from 108.9 to 128.5 mm, over the upper part of which there were rigged covers with mesh 40 mm. The samples used included fish which were retained in the codends and those which escaped into the covers.

Localities of captures are given in the attached map (Fig. 1). Data on the kind and amount of material collected, dates of experiments and the depth range of catches on particular fishing grounds are given in Table 1. A total of 11,866 fish were measured and 1,340 individuals were subject to biological analysis.

The object of the observations included: distribution, catch per effort, age and length of fish and the stage of sexual maturity. Age was determined from longitudinal cross sections of otoliths. Age composition was established according to an age/length key applied to mass measurements, and sexual maturity was determined by Maier's scale.

Occurrence in the catches

The occurrence of American plaice in the catches is given in Table 2. From the data different catch per effort and different percentage of American plaice were noted in the catches in relation to particular fishing grounds.

Off Newfoundland the catch per hour ranged in general from 13.9 to 251.2 kg. The highest catch per effort was obtained over the northeastern slopes of the Great Newfoundland Bank and on the northwestern part of Woolfall Bank (3L).

Off Nova Scotia the catch per hour was slightly lower, being different on particular fishing grounds and ranging from 8.9 kg over Sable Island Bank (4W) to 147.5 kg over Scatari Bank (4V).

Length composition

The length of fish on particular fishing grounds is shown in Fig. 2; mean lengths are given in Table 2.

Figure 2 shows that the length of American plaice was different on particular fishing grounds. In the samples fish were from 11 to 67 cm in length.

The most often captured fish were from 30 to 38 cm in length. On Flemish Cap (3M) the catches were basically fish of 39 to 43 cm in length, near

length being 41.3 cm. Off the eastern part of Woolfall Bank most of the fish were from 30-47 cm in length, mean length 45.2 cm. The smallest fish, from 25 to 28 cm in length and mean length of 27.9 cm, occurred over the southwestern slopes of the Great Newfoundland Bank.

Age composition

The age composition of American plaice on the various fishing grounds is given in Fig. 2.

In the investigated material fish were from 2 to 28 years old. Fish 6, 7, 8 and 9 years old were most abundant in the catches.

Off the northeastern slopes of the Great Newfoundland Bank the 1958 year-class (7 years old) predominated in the catches. Off the northwestern part of Woolfall Bank 1955, 1956 and 1957 year-classes (8, 9 and 10 years old) were present. The youngest fish were taken over the southwestern slopes of the Great Newfoundland Bank, where the catches were basically of the 1958, 1959, 1960, 1961 year-classes (4, 5, 6 and 7 years old).

The proportion of older fish, 20 years and over, was small; only females were noted among them.

Sexual maturity

The stage of sexual maturity of American plaice on different fishing grounds is presented in Table 3.

From the data, all fishing grounds, except Flemish Cap, had fish with gonads in the stage of maturity II predominating. Off Flemish Cap most of the fish had gonads in stages V and VI; among them there were 14.3% females with gonads in stage V and 57.1% males with gonads in stage VI. On other fishing grounds a rather large percentage of males had gonads in stages VI and VII; females with running gonads were almost negligible (0.4-2.5%).

Generally, in the spring months, feeding fish were captured. On most of the fishing grounds only a small percent of fish were spawning. Of 11 fishing grounds only three had spawning fish in large numbers (fishing grounds of Flemish Cap, middle part of the Great Newfoundland Bank and St. Pierre Bank).

Conclusions

The data show that the catch per effort and the percentage of American plaice in the catches off Newfoundland are greater than those off Nova Scotia.

The length of fish captured off Newfoundland is generally greater than fish length in the catches off Nova Scotia.

In general, off Newfoundland the older year-classes predominated, whereas off Nova Scotia the year-classes were younger.

Most of captured fish had gonads in stage II; a small percentage of fish had running gonads and they were mostly males.

Table 1. Data concerning investigation of American plaice.

Fishing grounds	Days of investigation	Range of depth	Number-measured fish	Number-analysed fish
1 Flemish Cap	16.IV	180-360	112	112
2 Northeastern slopes of Great Newfoundland Bank	31.V 1.VI	88-220	1 718	100
3 Eastern part of Woolfall Bank	2.VI	80-84	215	100
4 Northwestern part of Woolfall Bank	3-4.VI	120-140	1 868	100
5 Middle part of Great Newfoundland Bank	29-30.V	68-90	323	82
6 Eastern part of Great Newfoundland Bank	17-23.IV	100-180	2 785	236
7 Southwestern slopes of Great Newfoundland Bank	28.IV	100-180	1 269	160
8 St. Pierre Bank	30.IV- 1.V	60-330	977	111
9 Scatari Bank	19.V	130-180	866	-
10 Banquereau Bank	2.V 14.V	60-200	1 561	271
11 Sable Island Bank	4.V	60-100	172	68
Total			11 866	1 340

Table 2. Occurrence and mean length (cm) of American plaice in catches.

Fishing grounds	Catch per hour	% in catches	Mean length in cm
1 Flemish Cap	15,4	3,2	41,3
2 Northeastern slopes of Great Newfoundland Bank	160,7	76,6	31,2
3 Eastern part of Woolfall Bank	33,6	20,8	45,2
4 Northwestern part of Woolfall Bank	251,2	62,0	39,7
5 Middle part of Great Newfoundland Bank	13,9	3,7	38,6
6 Eastern part of Great Newfoundland Bank	57,5	13,1	36,2
7 Southwestern slopes of Great Newfoundland Bank	33,9	11,1	27,9
8 St. Pierre Bank	81,4	35,7	39,9
9 Scatari Bank	147,5	6,1	30,7
10 Banquereau Bank	113,2	40,6	32,8
11 Sable Island Bank	8,9	15,5	36,4

Table 3. Sexual maturity of American plaice to Mair's scale

Fishing grounds	Date	Sex	% of fish in particulare stage of sexual maturity								Total
			I	II	III	IV	V	VI	VII	VIII	
1 Flemish Cap	16.IV	♂	-	-	-	0,9	12,5	57,1	-	-	70,
		♀	-	2,7	-	11,6	14,3	0,9	-	-	29,
		♂+♀	-	2,7	-	12,5	26,8	58,0	-	-	100,
2 Northeastern slopes of Great Newfoundland Bank	31.V 1.VI	♂	7,0	20,0	-	-	1,0	1,0	2,0	-	31,
		♀	4,0	54,0	-	-	-	-	1,0	10,0	69,
		♂+♀	11,0	74,0	-	-	1,0	1,0	3,0	10,0	100,
3 Eastern part of Woolfall Bank	2.VI	♂	-	9,0	-	-	-	9,0	18,0	11,0	47,
		♀	-	46,0	-	-	3,0	-	-	4,0	53,
		♂+♀	-	55,0	-	-	3,0	9,0	18,0	15,0	100,
4 Northwestern part of Woolfall Bank	3-4.VI	♂	-	7,0	-	-	3,0	12,0	18,0	23,0	63,
		♀	-	24,0	-	-	2,0	-	1,0	10,0	37,
		♂+♀	-	31,0	-	-	5,0	12,0	19,0	33,0	100,
5 Middle part of Great Newfoundland Bank	29-30.V	♂	-	9,8	-	-	-	30,5	13,4	-	53,
		♀	-	32,9	2,4	1,2	-	2,5	-	7,3	46,
		♂+♀	-	42,7	2,4	1,2	-	33,0	13,4	7,3	100,
6 Eastern part of Great Newfoundland Bank	17-23.IV	♂	-	11,9	0,8	3,0	21,2	6,8	0,4	-	44,
		♀	-	43,2	7,2	2,1	3,0	0,4	-	-	55,
		♂+♀	-	55,1	8,0	5,1	24,2	7,2	0,4	-	100,
7 Southwestern slopes of Great Newfoundland Bank	28.IV	♂	13,1	16,9	-	-	1,9	3,1	0,6	-	35,
		♀	6,9	51,2	3,8	0,6	1,9	-	-	-	64,
		♂+♀	20,0	68,1	3,8	0,6	3,8	3,1	0,6	-	100,
8 St. Pierre Bank		♂	4,5	5,4	1,8	4,5	0,9	30,7	10,8	3,6	62,
		♀	0,9	22,5	5,4	1,8	3,6	2,7	-	0,9	37,
		♂+♀	5,4	27,9	7,2	6,3	4,5	33,4	10,8	4,5	100,
9 Scatari Bank			No sexual determination								
10 Banquereau Bank		♂	0,7	10,7	-	0,4	7,4	7,4	8,5	3,7	37,
		♀	-	51,3	2,9	1,1	0,7	-	-	5,2	62,
		♂+♀	0,7	62,0	2,9	1,5	8,1	7,4	8,5	8,9	100,
11 Sable Island Bank		♂	1,5	7,3	-	3,0	11,8	8,8	-	-	32,
		♀	-	60,3	-	-	1,4	-	1,5	4,4	67,
		♂+♀	1,5	67,6	-	3,0	13,2	8,8	1,5	4,4	100,

Fig. 1.

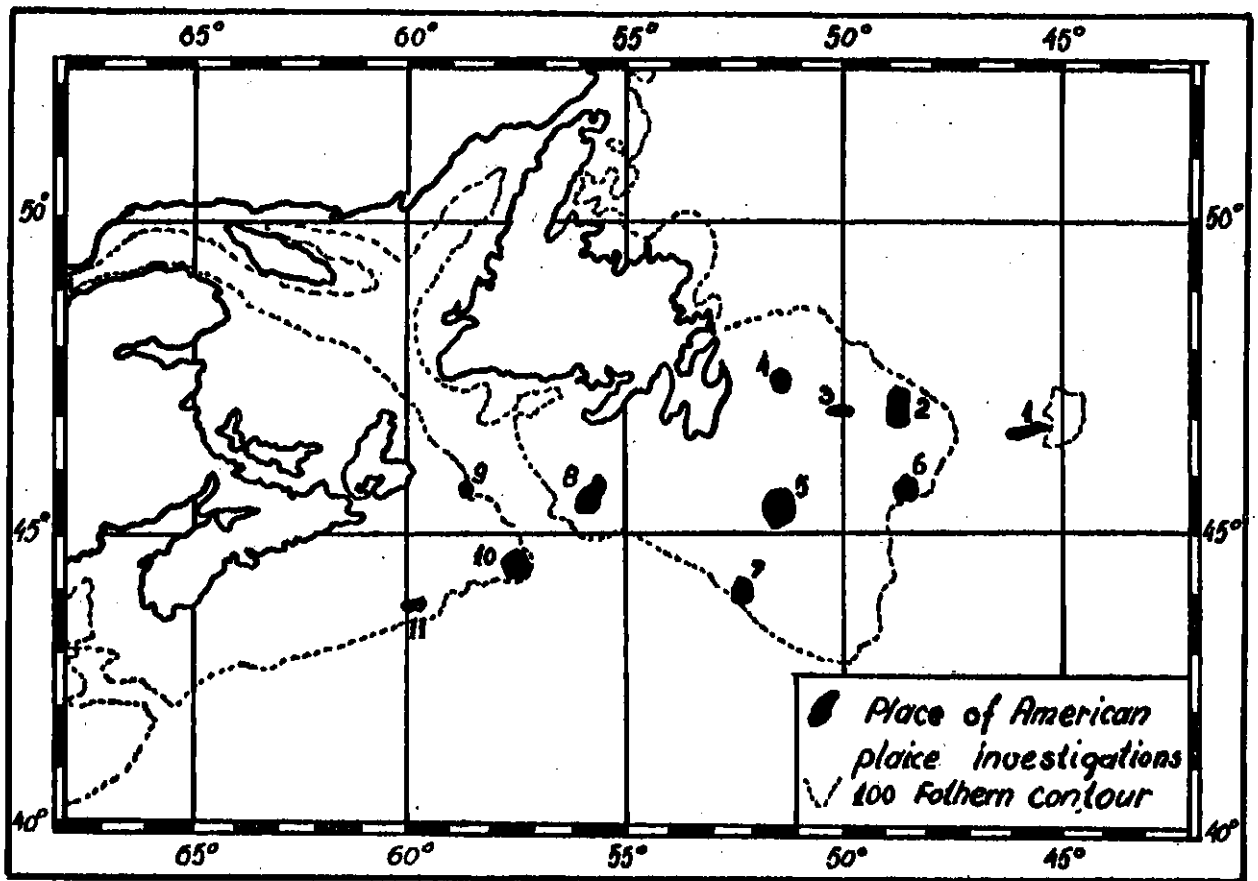


Fig. 1. Localities of investigations of American plaice, Spring 1965.

Demarcation of the places of investigations:

- 1 - Flemish Cap
- 2 - Northeastern slopes of Great Newfoundland Bank
- 3 - Eastern part of Woolfall Bank
- 4 - Northwestern part of Woolfall Bank
- 5 - Middle part of Great Newfoundland Bank
- 6 - Eastern part of Great Newfoundland Bank
- 7 - Southwestern slopes of Great Newfoundland Bank
- 8 - St. Pierre Bank
- 9 - Scatari Bank
- 10 - Banquereau Bank
- 11 - Sable Island Bank

Fig. 2. SUBAREA 3 and 4

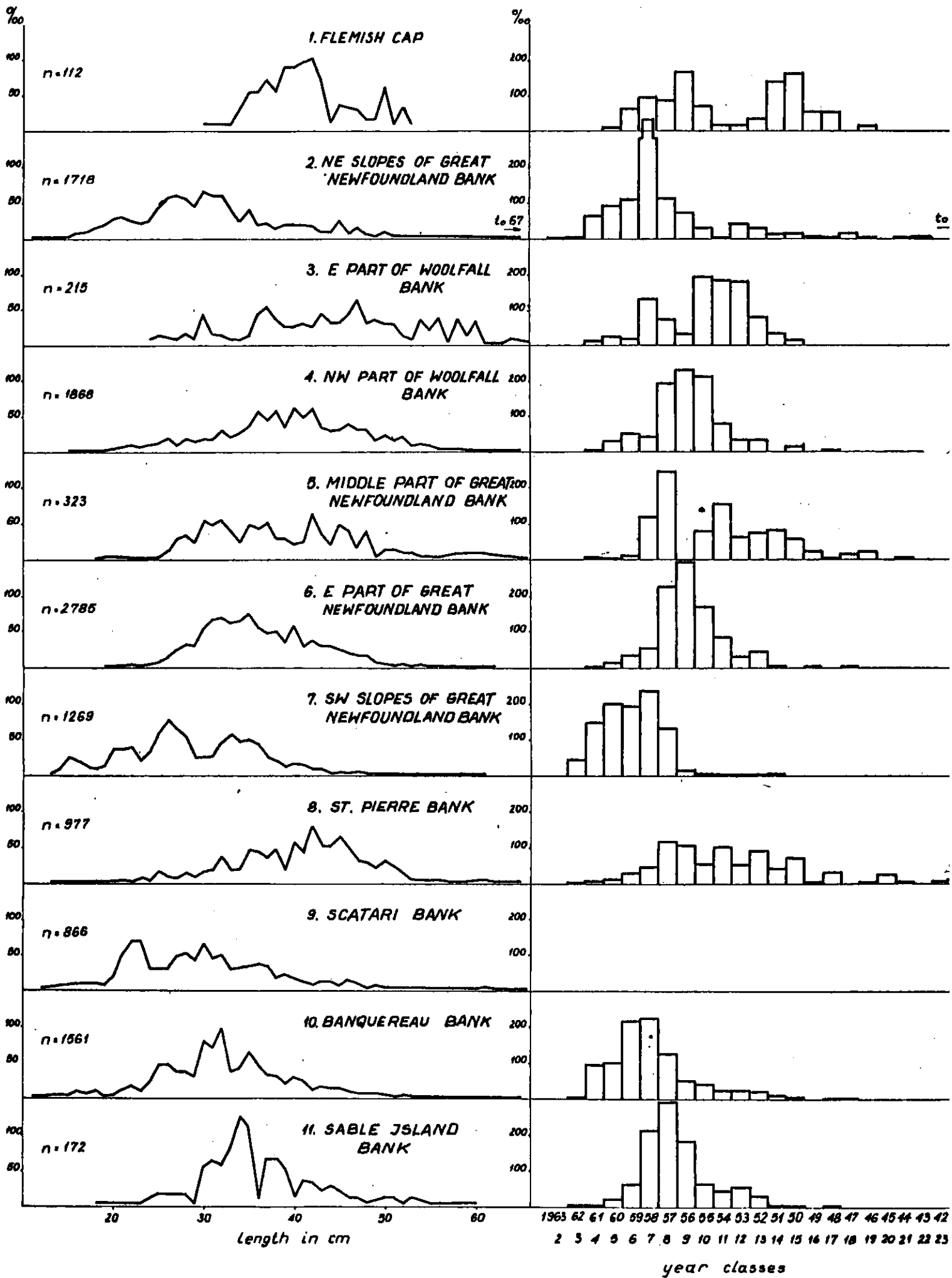


Fig. 2. Length and age composition of American plaice captured off Newfoundland and Nova Scotia, Spring 1965.