



Serial No. 2857
(C.c.72)

ICNAF Res.Doc. 72/46

ANNUAL MEETING - JUNE 1972

French Research Report, 1971

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State of the fishery

I. Metropolitan fishery

In 1971, during the first quarter, 50,240 tons of cod (*Gadus m. morhua*) were fished in the Northwest Atlantic by the commercial trawlers. The remaining fishing effort was diverted to the Northeast Atlantic where 31,130 tons of cod were taken.

West Greenland, from April to June (4,108 tons) and Labrador during January and February (5,909 tons) were less frequented, the best catches being made in Div. 1C and 2J.

The most important catches were made from February to April in the Gulf of St. Lawrence (Div. 4R - 24,363 tons) and less important catches in Southwest Newfoundland in Div. 3P (2,730 tons).

Equally good catches were also taken in Div. 3L, east of the Grand Bank (2,984 tons) and especially on Flemish Cap, in Div. 3M (9,006 tons).

Table 1 summarizes the state of the fishery. It is to be noted that these catches represent only 30.14% of the best tonnage obtained by the commercial trawlers, which was 166,683 tons in 1961. The 1970 catches, 66,131 tons, represented 39.67% of the 1961 tonnage.

II. Saint Pierre and Miquelon fisheries (Table 2)

In 1971 a total of 5,528 tons of various species was taken by Saint Pierre trawlers and by the 60 dories of the Island. The above-mentioned figure represents 62.77% of the average catch of Saint Pierre, based on a 10-year (1961 to 1970) average (8,806 metric tons round weight), and 40.72% of the best catches for 1961 (13,575 tons).

The decrease in the catches can be explained by the almost complete disappearance of the haddock (*Melanogrammus aeglefinus*), 52 tons in 1971 compared to 2,918 tons in 1960, 4,633 tons in 1961, 2,429 tons in 1962, 1,181 tons in 1970, etc. and also by an appreciable decrease in cod catches, 1,861 tons compared to 2,178 tons in 1970, 4,416 tons in 1960, 5,595 tons in 1961, etc. In summary, there was a constant level of fishing effort by the industrial trawlers (3-4 trawlers) although these did not use modern sonar detection or fishing gear (wide vertical opening trawl or pelagic trawl).

It is interesting to note that of the 1,861 tons of landed cod, the dory catches were 1,196 tons and only 665 tons by trawlers. The dory catches were made nearshore and most of the commercial catch by trawlers in Div. 3Ps (455 tons) on Saint Pierre and Burgeo Banks.

The American plaice (*Hippoglossoides pl. platessoides*) catches were made

mostly in Div. 3Ps (Saint Pierre Bank) and in Div. 3L. The total catch, 1,166 tons, is an increase compared to that of 1970, 812 tons.

The larger part of the redfish (Sebastes m. mentella) catch was made on the slopes of Saint Pierre and Burgeo Banks (Div. 3Ps), but only 79 tons were taken in Div. 3Pn, while 249 tons were taken in Div. 4Vn, on the slopes of Scatarl Bank.

There was a slight increase in the total 1971 redfish catch, 1,747 tons, compared to 1970, 1,627 tons.

With 302 tons of skates (mostly Raja radiata) and 172 tons of yellowtail flounder (Limanda ferruginea), one can say that the main fishery activity in Saint Pierre consists of 3 species: cod (decreasing), American plaice and redfish (gradually increasing).

III. Research

The Saint Pierre research centre had at its disposal the R/V Cryos from 19-29 January and from 6 May-11 December 1971.

Investigations were carried out:

- 1) on herring, on two cruises from 19-29 January, in bad weather, with only 17 trawl hauls being made, and from 6-14 May with 26 trawl hauls made;
- 2) on groundfish, cod (Gadus m. morhua), haddock (Melanogrammus aeglefinus), redfish (Sebastes m. mentella), American plaice (Hippoglossoides pl. platessoides), etc.

Two cruises were made: one from 6-28 July (61 trawl hauls) and the second from 8 November-4 December 1971 (78 trawl hauls).

One cruise was particularly devoted to the study of the deep-sea prawn (Pandalus borealis) in deep waters off Nova Scotia, between 16 May and 7 June (46 trawl hauls).

As will be seen later, a study of pre-recruit herring was undertaken jointly with USA, USSR and Fed. Rep. Germany at the end of September and beginning of October (58 trawl hauls). Sampling of silver hake was also made. During December on Saint Pierre Bank, dredging was also made for a study of the distribution of the scallop.

Environmental study

An environmental study was carried out in Subdiv. 3In, 3Ps, 4Vn and 4Vs during July. This can be summarized as follows:

Near bottom conditions

Figure 1 shows the temperature distribution of the Gulf of St. Lawrence waters along the coast of Cape Breton Island and on Nova Scotia banks (1°C to 3°C).

In the Laurentian Channel waters are warmer (5°C-6°C, and even 7°C in the northern part).

On the eastern side of Saint Pierre Bank, we note two cold water lobes: the first is on the south tip of the Bank (0°C) and the other on the south of Saint Pierre (1°C). In the central part of the Bank, there is an isolated core of cold water (1°C).

On the west side of Saint Pierre Bank, a strong thermal gradient can be observed on the slope (from 0°C to 6°C to the south, and from 2°C to 6°C to the north). The same phenomenon is observed on the slope of Burgeo Bank.

Surface temperature

Figure 2 shows particularly the difference between the eastern and western parts of the Laurentian Channel. Saint Pierre Bank and the south coast of Newfoundland are influenced by the cold water from the east (12° to 13°C). On the other hand, in July, Sydney Bay is influenced by the warmer waters of the Gulf of St. Lawrence (17° - 18°C).

Study of fishes

Subarea 5

A cruise was made by R/V Cryos on Georges Bank and the Gulf of Maine from 7 September-7 October. The first part of the cruise (8-24 September) was devoted to the study of the abundance and distribution of herring larvae in accordance with the program established during the 1971 ICNAF Annual Meeting. Results are presented in ICNAF Res.Doc. 72/62.

From 27 September to 7 October, the slopes north and south of Georges Bank were surveyed in order to study the stock of commercial fishes. Important herring concentrations on which a large number of trawlers were fishing were situated on the northern part of the Bank. Groundfish catches were very low.

Herring (Clupea harengus harengus)

The herring fishery was located near $42^{\circ}00'\text{N}$ and $67^{\circ}20'\text{W}$. All fishes measured 25-37 cm with modal lengths of 28, 29 and 30 cm (Fig. 3). The fish were in spawning condition.

Silver hake (Merluccius bilinearis and Merluccius albidus)

Only a few specimens of M. albidus were taken on the southern slope of Georges Bank. Regarding M. bilinearis, 5 hauls in the same area yielded 446, 512 and 667 kg/hour of fishing at depths between 170 and 245 m. In all other cases, catches were very small, ranging from 10 to 50 kg/hour, the maximum yield being 100 kg/hour.

Individuals measured 18 to 49 cm, with a mode of 29 cm (Fig. 4). Figures 5 and 6 show the distribution of year-classes and stages of sexual maturity of males and females. Results are presented for both species in ICNAF Res.Doc. 72/61.

Cod (Gadus m. morhua), etc.

Cod, red hake (Urophycis chuss and Urophycis tenuis) and cusk (Brosme brosme) were taken in very small quantities, scarcely exceeding 50 kg/hour of fishing. The best catches were made on haddock (Melanogrammus aeglefinus) on the north of the Bank, ranging from 136, 231, 238 and 288 kg/h, but were only incidental catches.

Individuals measured 39-80 cm, with modes of 47, 57, 63 and 70 cm (Fig. 7).

Redfish (Sebastes marinus mentella)

One trawl haul yielded 1,920 kg/hr south of Georges Bank at a depth of 330 m.

Other fishes

Negligible quantities of flatfishes were taken. Catches of lobster on the southern slope of Georges Bank were smaller than those made in the same area in 1969.

Study of herring (Clupea h. harengus)

Catches

During 1971 good catches were made by R/V Cryos, off Cape Breton Island (Div. 4Vn) and north of Georges Bank (Div. 5Ze). In Div. 4Vn (Cape Smoky) 862 kg/h were taken on 18 May: 1,410 measurements were made, with lengths ranging from 18-39 cm; 46% of the herring had not reached the first stage of sexual maturity (average weight 94 g) (Fig. 8). In Div. 5Ze (Georges Bank) 100 kg were sampled on spawning concentrations on 28 September. All individuals were at Stage VI and their lengths ranged from 25 to 36 cm (Fig. 8). Mean weight was 200 g with average lengths of 28.81 cm.

Biological observations

Biological observations are described in ICNAF Res.Doc. 72/55.

Other observations were made on the fat content of the fishes (Table 3).

Observations on the mercury content were made on the sample collected on 26 January on St. Ann Bank, giving a result of 0.03 mercury per mg/hk wet weight (Science et pêche, No 209).

American plaice (Hippoglossoides pl. platessoides)

Observations were made on St. Pierre, Scatari and St. Ann Banks (Figs. 9 and 10). Results are given in ICNAF Res.Docs. 72/53 and 72/56.

Deep-sea prawn (Pandalus borealis)

Surveys were made in 1971 in Div. 4Vs, 4W, 4X. From 20 May to 6 June 96 trawlings were made along with hydrological observations. 29 of 46 hauls yielded a total catch of 865 kg. The best yields were obtained in Canso deeps and Artimon Bank, reaching 88 kg per half-hour of fishing. The greatest part of the population had an Lc less than 25 mm. During these trawling operations a total of 9,700 kg of fish were taken, the proportion of prawn being only 9% of the total weight. Most fishes were immature.

The proportion of cod catches per 100 kg of prawn was 390 kg in March 1970 and only 60 kg in May and June of 1971. Results of these surveys are given in ICNAF Res.Doc. 72/54.

Table 1. Metropolitan fishery statistics, 1971.

Sous-zone	Morue	Totaux
1 C	2 603	
1 D	1 007	
1 E	498	
		4 108
2 H	14	
2 J	5 895	
		5 909
3 K	500	
3 L	2 984	
3 M	9 006	
3 N	19	
3 O	1	
3 P	2 730	
		15 240
4 R	24 363	
4 T	2	
4 Vn	618	
		24 983
Total général (poisson rond)		50 240 t

Table 2. Saint Pierre and Miquelon fishery statistics, 1971.

Sous-zone	Morue	Anon	Balal	Rouget	Merlu	Sole	Fletan	Chat	Lotte	Raie	Carrelet	Déchets	Total
3 L	43		241			2		20		56	16	16	394
3 N	45		60	6		8		2		17	32	6	184
3 O	16		14	2		2				3	1		38
3 Ph	26			79		3				3			111
3 Ps	1 196	45	820	1 325	1	57	2	30	6	213	120	63	4 333
3 Ps	1 351												
Total sous-zones	1 781	45	1 163	1 412	1	72	2	52	6	292	169	85	5 060
4 R	68	6	4	33		1		1			1	1	115
4 S	1		1	17								1	20
4 Vn	7	1	13	39		3				7	2		282
4 Vs	4		5	16		3				3			51
Total sous-zones	90	7	23	325		7		1		10	3	2	468
Total C'nfral	1 361	52	1 166	1 717	1	79	2	53	6	302	172	87	5 528

* 455 = Pêche industrielle
 5 Ps = Pêche artisanale
 Total = Total de la zone en 3 Ps.

Table 3. Percentage fat content of autumn and spring herring in the various stages of maturity.

Origine	nombre examinés	stade de maturité	R.C.G.	G. p cent
I. Populations d'automne				
Cap Smoky	5	I et II	0,36	6,01
Fosse Artimon	12	III	3,94	11,59
Baie de Sydney	11	IV	8,99	14,71
	4	V	15,27	16,12
Banc Georges	13	VI	20	7,71
	8	VII - VIII	0,52	10,25
Cap Gabarus	12	VIII	1,42	6,10
Cap Smoky	9	VIII - III	1,80	11,26
II. Populations de printemps				
Cap Smoky	8	IV	8,67	13,75
Cap St. Laurent	9	V	14,92	10,13

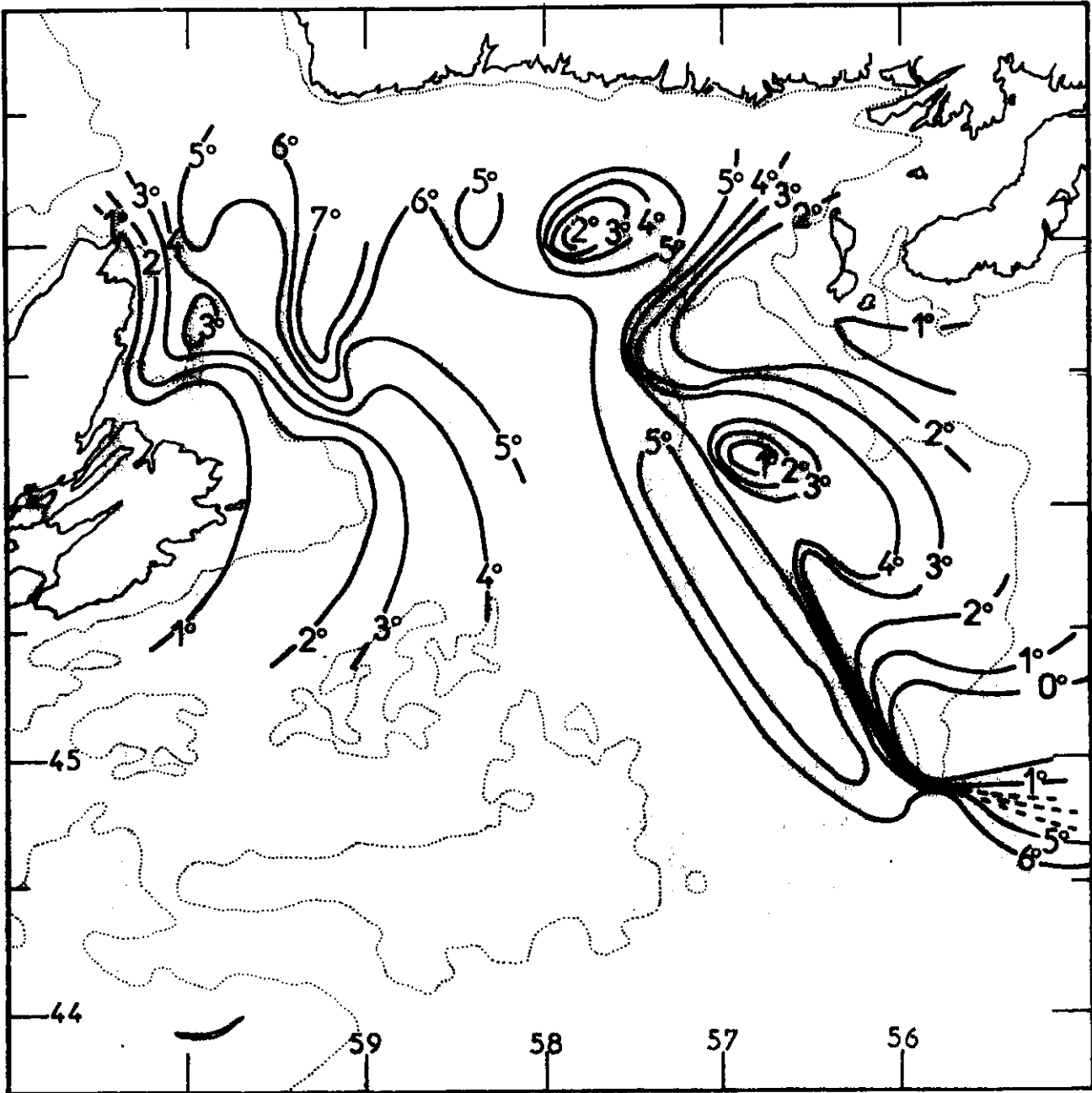
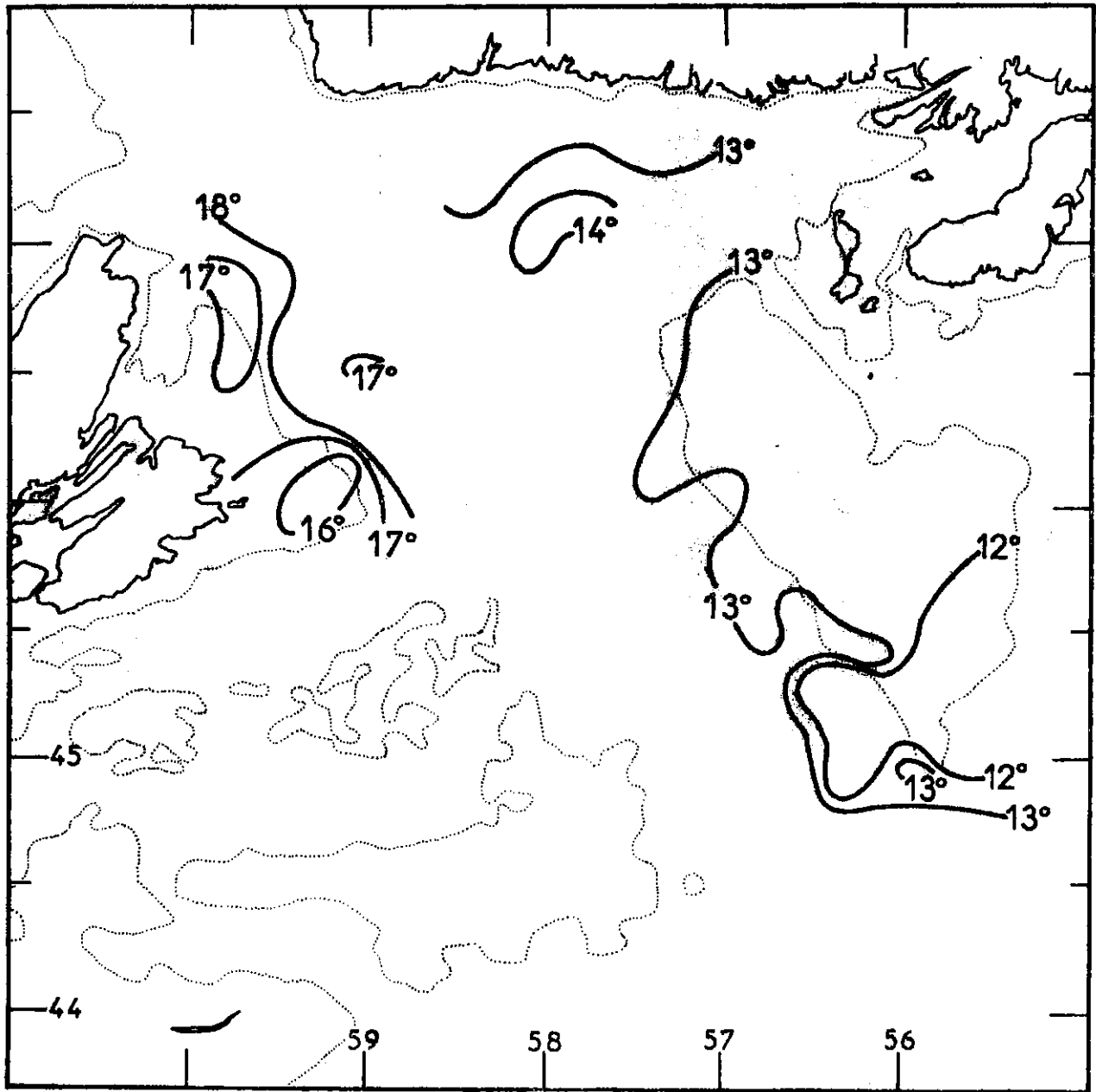


Fig. 1. Contour lines of depth, in fathoms.



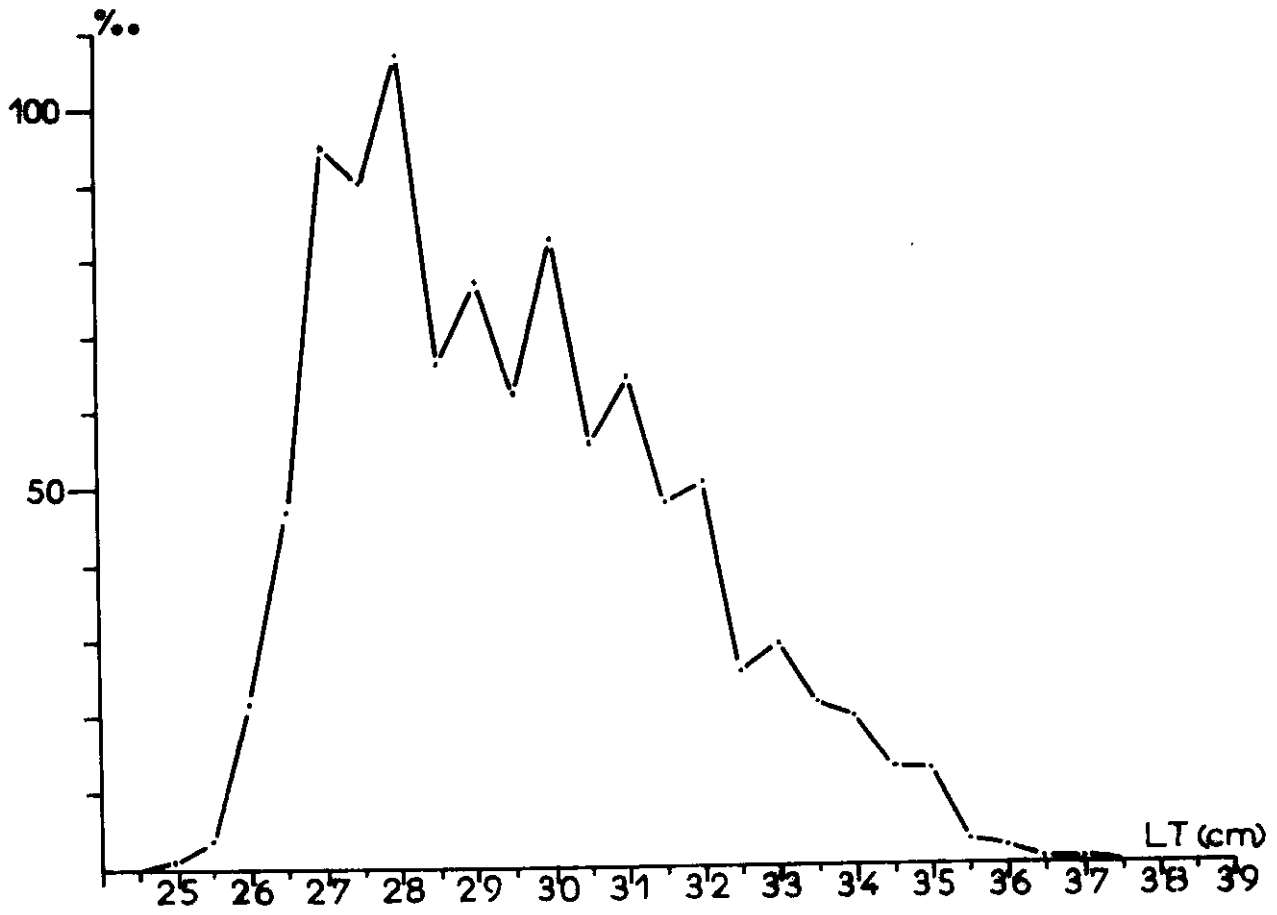


Fig. 3. Length frequency of herring from Georges Bank.

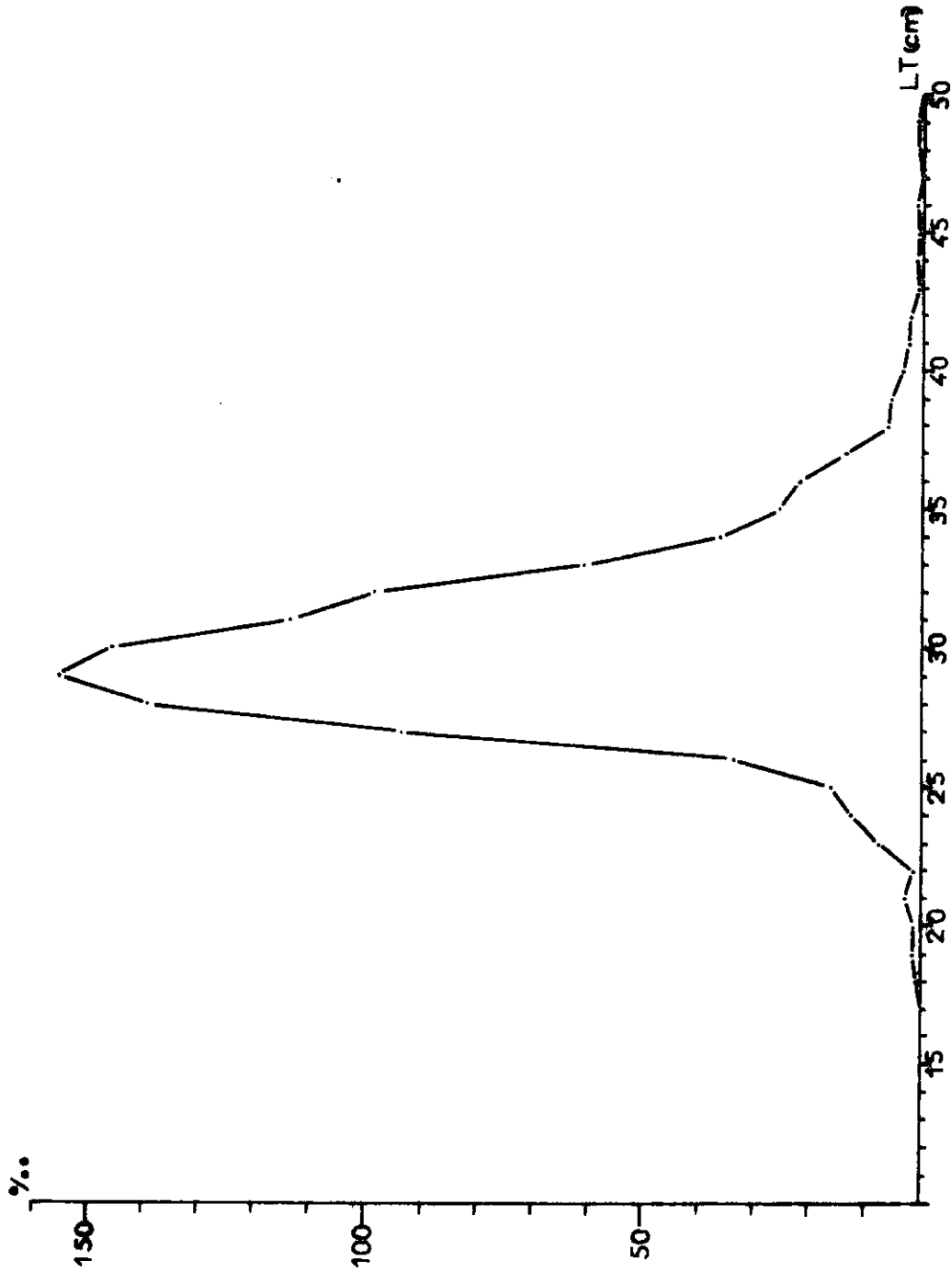


Fig. 4. Length frequency of lake trout from Georges Bank.

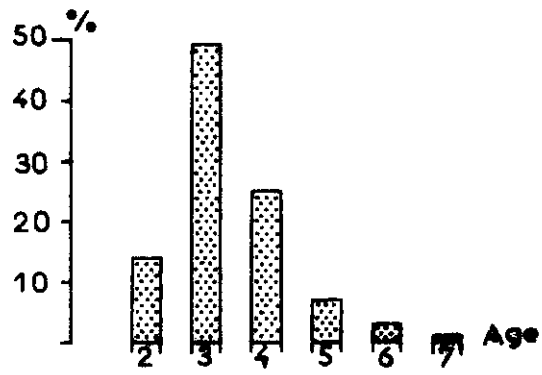


Fig. 5. Age composition of hake.

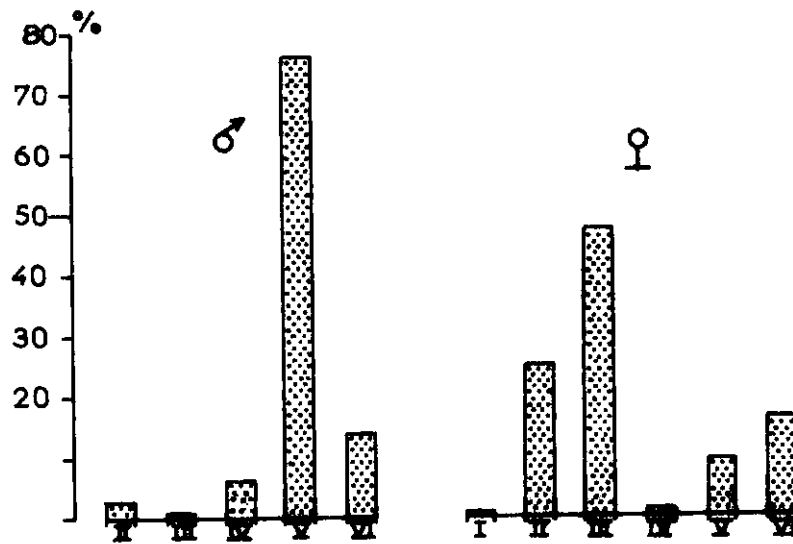


Fig. 6. Stages of maturity of male and female hake.

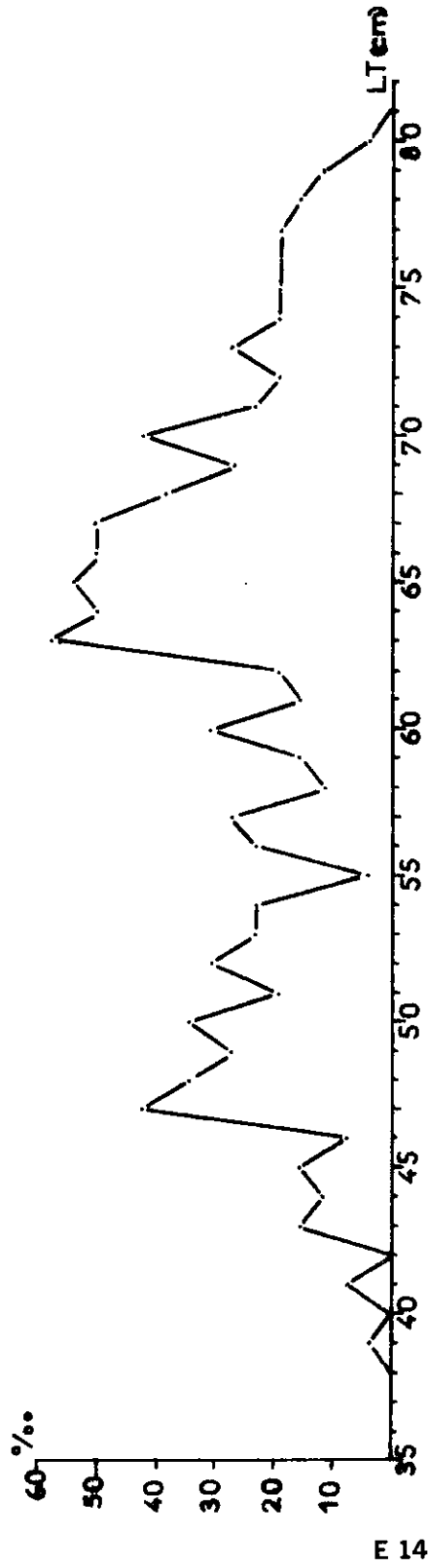


Fig. 7. Length frequency of haddock from Georges Bank.

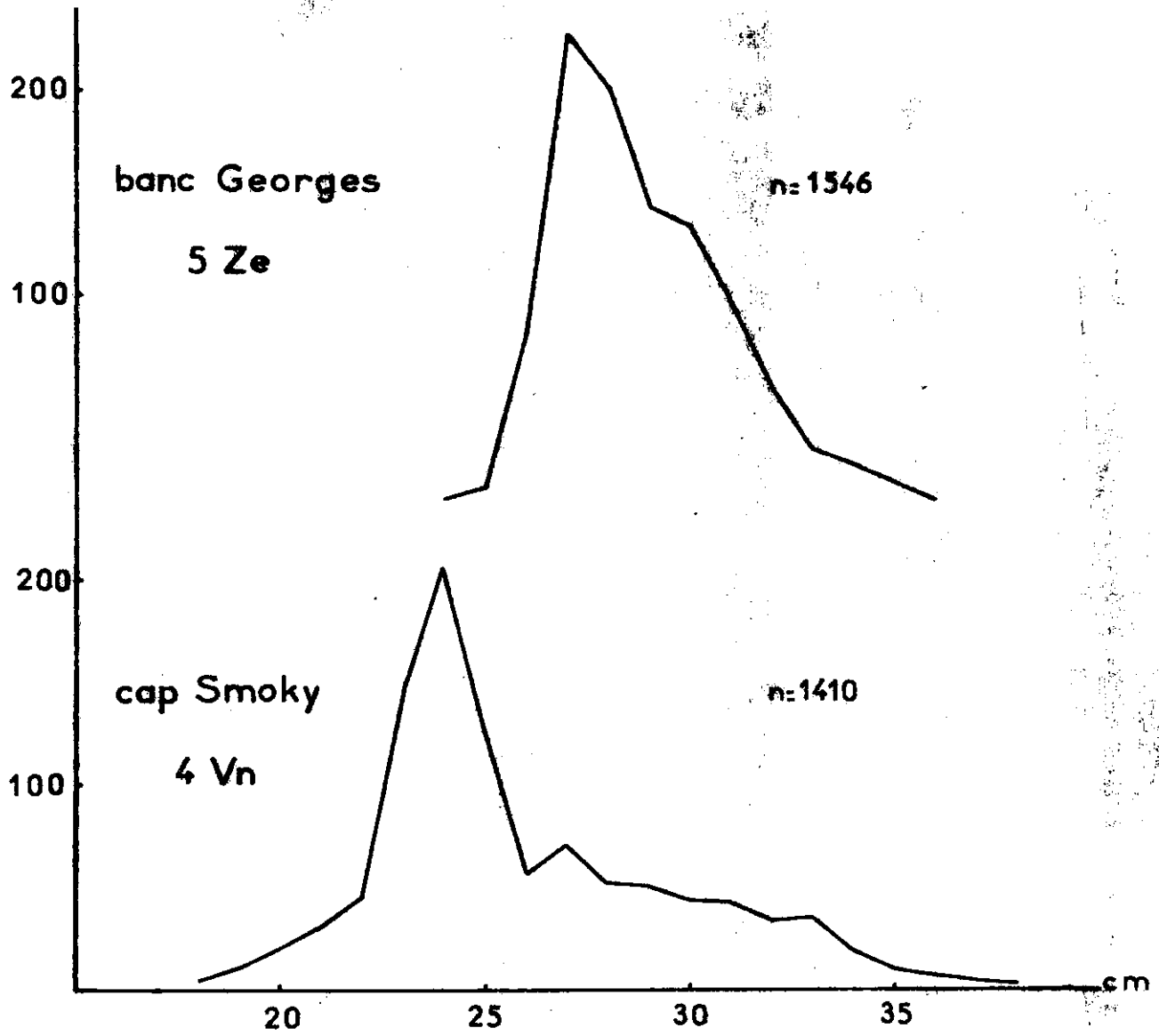


Fig. 8. Length frequency of herring in Subdiv. 4Vn and 5Ze.

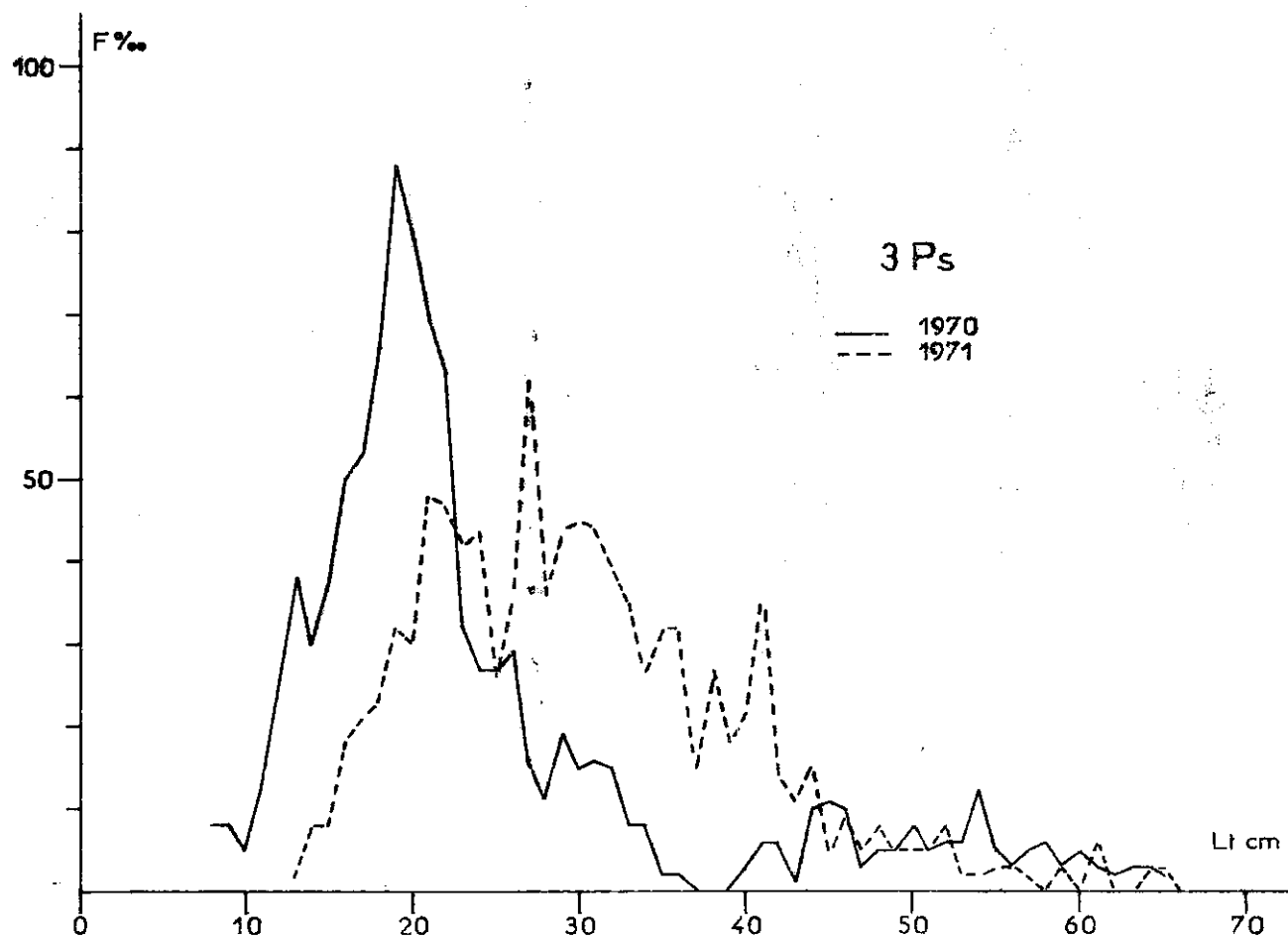
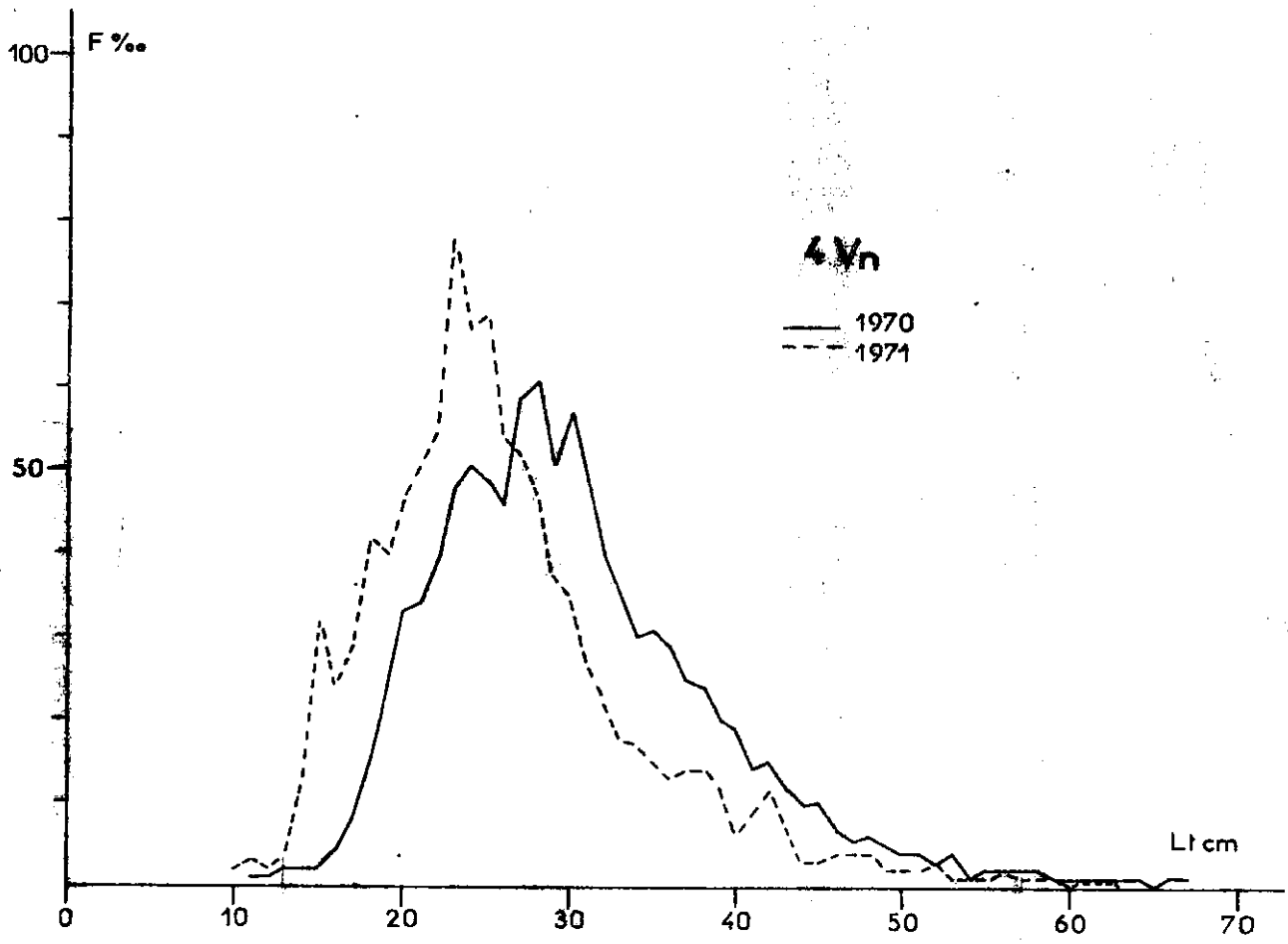


Fig. 9. Length frequency of American plaice in 1970 and 1971 in Subdiv. 3Ps.



16. Length frequency of American plaice in 1970 and 1971 in Subdiv. 4Vn.