The Belgian Trawl Fishery on the **Full-Herring Concentrations.**

A. Activity - Landings - Value.

The first full-herring catch was landed on 19. July 1950. It came from the Fladen ground where the herring fishery was carried on until the end of August. From early September until 15. October most trawlers were fishing south of this area, viz. the "Gut". As from the second fortnight of September until the end of October, the herring trawlers were mainly active around the western and south-western part of the Dogger bank. In November and December, full-herring concentrations were only exploited in the southern area of the North Sea, particularly around the lightships "Ruytingen" and "Sandettié". There the fishery ended on 6. December 1950.

40 trawlers took part in the full-herring fishery. This total comprised 2 trawlers of Class II (motor trawlers of 80 to 119 H.P.), 9 of Class III (motor trawlers of 120 to 239 H.P.), 16 of Class IV (motor trawlers of 240 to 349 H.P.), 7 of Class V (motor trawlers of 350 to 500 H.P.) and 6 of Class VI (steam trawlers of 480 to 850 H.P.).

213 catches or voyages were recorded totalling 1,684 sea days or 15,997 effective fishing

hours.

The H.P. developed is equal to the driving power of the trawler multiplied with the number of effective fishing hours. If, for instance, a trawler is driven by a 240 H.P. motor, it is considered as having developed 240 H.P. per hour.

Table 8. Number of the Belgian Herring Trawlers (t), and of their Voyages (v)

-	Trawlers (t), and or their voyages (v).												Effective Fishing flours (F. II.).									
	C1.	. II	Cl.	III	C1	. IV	Cl	. V	C1	. VI	To	otal					Classe	s of Ve	ssels			
H.P.	80-	-	120-	_	240-	_	350-		480-	_			II		II	I	IV	•	V		VI	
		119		239		349		500)	850			S.D.	F.H.	S.D	. F.H.	S.D.	F.H.	S.D.	F.H.	S.D.	F.H.
	t.	v.	t.	v.	t.	v.	t.	ν.	t.	v.	t.	v.										
(a) Ac	cordi	ng to	fish	ing g	roun	ds.						l	(a) A	ccord	ling	to fishi	ing gro	unds.				
FL.1)		_			7	10	7	16	6	15	20	41	_				115	1214	160	1650	159	1790
C.2)	_	_			12	40	7	46	6	35	25	121		19.7		_	385	3989	383	3191	274	2205
S.3)	2	3	9	31	4	12	3	5		8	18	51	12	66	123	1188	40	406	33	298	_	
(b) Ac	cordi	ng to	moi	nthly	peri	ods.							(b) A	ccord	ling	to moi	nthly p	eriods.				
July				_		_	2	2	1	4	3	6							21	279	43	593
Aug			—		7	14	6	16	6	15	19	45				_	157	1702	160	1569	149	1620
Sept	-		—	—	13	26	7	23	6	17	26	66	_				253	2843	.185	1415	138	1029
Oct	2	2	2	2	4	11	7	19	5	13	20	47	7	54	5	72	85	634	163	1444	90	663
Nov	1	1	9	26	4	11	4	7	1	1	19	46	5	12	107	995	45	430	47	432	13	90
Dec			3	3	—	_	-	_		-	3	3			11	121				-	-	-

¹⁾ Fladen Ground.

3) Southern Area, chiefly around the light vessels "Ruytingen" and "Sandettié".

During the 1950 season 7,555 tons of herring were landed. The catches in the various regions and in each month are shown in Table 9, and the average catch per vessel and per fishing hour and H.P. are shown in Table 10.

From the whole herring fleet 35 tons were landed per voyage, 4.5 tons per sea-day and 116 Kg. per fishing hour and per 100 H.P.

B. Biological Statistics.

The material studied comprises 1200 herrings. 280 were from the Fladen ground, 175 from the Gut and 745 from the south-western and western parts of the Dogger bank.

The material from the Fladen ground was collected in August; that from the Gut in August and September, and that from the south-western and western parts of the Dogger bank in September and October. (See Tables 13—16 A.)

The census for the vertebrae covered 1200 specimens of which there were 32, or 2.66 %, with one or more fused vertebrae and 4, or 0.33 %, with damaged vertebrae. These specimens have been eliminated from our material. (See Table 16 B).

Stomachal Contents.

Among the 1200 stomachs examined, 310, or 25.83 %, were found to have contents and of these 4 or 0.33 % were full, 12 or 1 % half full, and 293 or 24.38 % a quarter full.

The contents observed consisted mainly of copepods and smaller quantities of schizopods. One stomach contained a small mackerel of

$\mathbb{R} \to 9$. Number of Sea-Days (S.D.) and of Effective Fishing Hours (F. H.)

²⁾ Central Area of the North Sea, chiefly the Gut and the western and south-western parts of the Dogger.

Table 10. Total Weight landed (in 1000 Kg.).

Table 11. Average Catch (1000 Kg.) per voyage (C/V) and per fishing hour for 100 H.P. developed (C/H).

	Cl. II	Cl. III	Cl. IV	, Cl. V	Cl. VI	Total	C1.	II	Cl.	III	Cl.	IV	C1.	v	CI.	VI	To	tal
(a). Accordi	ing to f	fishing	ground	ls.			C/V	C/H	\mathbf{C}/\mathbf{V}	\mathbf{C}/\mathbf{H}	C/V	C/H	\mathbf{C}/\mathbf{V}	C/H	\mathbf{C}/\mathbf{V}	C/H	C/V	C/H
Fladen	_		230	459	708	1397	_				23	66	29	68	47	61	34	64
C. Area	—		1141	2159	2574	5875				_	29	102	47	164	74	181	49	152
S. Area	3	153	70	56	_	282	1.1	47	5	72	6	63	11	47	_		6	63
% of total.	0.04	2.0	19.1	35.4	43.4	99.9												
(b). Accordi	ing to 1	monthl	y perio	ds.														
July			-	49	138	187			_	—		/	25	44	35	29	31	32
August			358	590	959	1907			_	—	26	71	37	91	64	91	42	88
September	_		685	1314	1386	3385			_	—	26	86	57	224	82	217	51	167
October	2.5	10	322	648	793	1775	1.3	43	5.0	75	29	180	34	109	61	207	38	151
November	0.8	131	77	74	7	289	0.8	69	5.0	73	7	64	11	43	7	15	6	56
December.	-0.77	12	_	_	_	12	_		4.2	59	-		-	_	-	-	4	59

about 7 cm. Some stomachs were found to contain eggs and scales of herrings and a few contained sand; this was most probably swallowed during the trawling or during the hauling of the nets.

C. Considerations about the Exploitation and on the Results.

I. Activity-Landings-Value.

In comparison with the full-herring season of 1949, there was, in 1950, a slight increase in the activity of the herring trawlers; 40 trawlers took part in the fishery as against 30 in 1949. The number of voyages increased from 172 to 213, the number of sea-days from 1,680 to 1,684 and the number of effective fishing hours from 15,545 to 15,997.

The total landings were 7,554,860 Kg. as against 8,794,195 Kg. in 1949. The average catch per sea-day was also lower at 4,486 Kg. as against 5,235 Kg., whilst the average catch per hour for 100 H.P. developed was somewhat higher at 116 Kg. as against 103 in 1949.

It seems peculiar that only the catch per hour's fishing for 100 H.P. developed had a higher average in 1950 than in 1949 while all other averages recorded in 1950 were lower. This was due to the average number of H.P. developed per fishing hour being con-

siderably lower than in 1949, viz. 406 H.P. against 550 H.P. The density of the herring concentrations exploited by the Belgian herring trawlers tended to show an increase in 1950.

If we calculate the average catch per hour's fishing for 100 H.P. developed for each fishing ground separately we find that the density differs considerably from area to area.

It was in the central part of the North Sea (Gut and the western and south-western part of the Dogger bank) that the average catch per hour's fishing for 100 H.P. developed reached its highest level, viz. 152 Kg. against only 64 Kg. on the Fladen and 63 Kg. in the southern North Sea. The corresponding 1949 averages were: Fladen 96 Kg., western part of the central area of the North Sea, 124 Kg., southern North Sea, 59 Kg. Thus, from 1949 to 1950 the average catch for one hour's fishing for 100 H.P. developed decreased considerably on the Fladen ground but showed a substantial increase in the central North Sea and a slight increase in the southern North Sea area.

II. Biological Statistics.

In comparison with 1949, the average length of the herring in 1950 was 1 mm. lower at 161 mm. against 162 mm.

Table 12. Recapitulation of the Activity of the Herring Trawlers and of the Results recorded for the Period 1946—1950.

_		N	umber of		Weight	Average	Average Catch/	Value	Average
Season	Trawlers	Voyages	Fishing Hou	rs H.P. devel. per hour	landed (1000 Kg.)	Catch per Voyage (Kg.)	Hour 100 H.P. developed	(1000 Frs.)	Price per Kg.
1946	46	257	18,707	396	10,941	42,572	147	46,191	4.22
1947	60	315	33,306	440	14,365	45,604	98	55,968	3.97
1948	80	332	30,199	450	14,131	42,562	104	46,277	3.27
1949	30	172	15,545	550	8,794	51,129	103	22,555	2.56
1950	40	213	15,997	406	7,555	35,469	116	24,476	3.24

Table	13.	Percentage	Distribution.

	C 11	(1)	3.5	Y			TWY 4 7 /		~
_l.	Centimetre	CHUSS,	Mean	Length	(em.).	Average	weight.	and	Sex.

Fladenground Gut Doggerbank	22 2.9 1.1 2.8	23 6.1 1.7 13.1	24 16.0 8.0 21.1	25 16.0 14.3 20.5	26 20.4 16.0 14.8	27 17.1 20.6 13.6	28 18.2 27.4 12.2	29 2.9 10.9 1.8	$ \begin{array}{c} 30 \\ 0.4 \\ \hline 0.1 \end{array} $	Mean 26.3 27.1 25.7	Aver. Weight 164 gr. 174 » 148 »	% Males 52.1 48.0 50.3
Total	2.6	9.8	18.0	18.6	16.3	15.4	15.8	3.3	0.2	26.1	155 »	50.4

B. Stages of Maturity and Quantity of Mesenteric Fat.

				Stages		Mesenteric Fat						
	I	II.	III	IV	V	VI	VII	VIII-II	0	1	+	M
(a). According to origin												
Fladenground	1.4	1.8	37.9	34.6	23.9		0.4	-	0.7	28.9	32.2	38.2
Gut	-	1.7	12.6	18.9	65.7	-	-	1.1	22.3	44.6	21.1	12.0
Doggerbank	0.3	0.1	4.2	12.7	36.5	36.5	2.6	7.1	32.9	39.1	17.8	10.2
Total	0.5	0.7	13.2	18.8	37.8	22.7	1.7	4.6	23.8	37.5	21.7	17.0
(b). According to groups												
1st group (Stages I to III) 2nd group (Stages IV to	3.4	5.2	91.4	_	_	-	-	-		0.6	11.5	87. 9
VIII-II)	-	-	= = 5.5	21.9	44.3	26.5	1.9	5.4	27.9	43.7	23.4	5.0

C. Year-Classes observed and Age-Groups of Total Catch compared for 1946-50.

Number of Herrings with readable scales in 1950:425.

Winter rings	2	3	4	5	6	7	8	9	+
Age (Years)	3	4	5	6	7	8	9	10	
Year-Classes in									
1950 catch	1947	1946	1945	1944	1943	1942	1941	1940	before
									1940
Fladenground	15.5	33.0	8.2	6.2	8.2	14.4	7.2	5.2	2.1
Gut	2.0	13.3	11.2	10.2	13.3	13.3	18.4	10,2	8.1
Doggerbank	10.9	31.7	20.9	7.4	7.4	6.1	2.6	5.6	7.4

Table 14. Average Length (cm.) observed for Table 15. Average Value of L_1 (mm.) of each each Year-Class.

Herrings	Age	No	orth S	ea		North				Year-(Classes	S			Mean
born in	(Years)	Fladenground	Gut	Doggerbank	Total	Sea	1947	1946	1945	1944	1943	1942	1941	1940	
1947	3	23.7	23.7	23.9	23.8	Fladen	115	105	121	99	119	114	112	114	111
1946	4	24.7	25.1	24.9	24.8	Gut	98	99	100	110	112	115	114	99	108
1945	ő	25.2	26.0	25.9	25.8	Dogger	112	107	109	112	116	97	117	105	110
1944	6	26.1	26.8	26.8	26.6	Total	112	105	109	109	115	108	114	104	110
1943	7	27.5	27.1	27.4	27.3										
1942	8	27.7	28.1	27.9	27.9										
1941	9	27.9	28.4	28.1	28.2										
1940	10	27 9	28.3	28.4	28.3										

Table 16. Percentage Distribution.

A. Number of Vert	A. Number of Vertebrae and Vertebral Average. Number of Vertebrae											B. Keeled Scales (K ₂) and Average.								
						Num	ber of	K ₂												
	55	56	57	58	59	Average	12	2	13	14	15	16	17	18	19	Average				
(a). According to origin																				
Fladenground	3.6	45.1	49.5	1.8	A	56.49	0.	7	5.0	31.8	43.9	17.5	0.7	-	0.4	14.76				
Gut	3.5	47.4	46.2	2.9		56.48	_	-	5.2	27.7	50.9	11.0	5.2	-		14.83				
Doggerbank	4.2	46.1	45.1	4.3	0.3	56.50	-	-	4.9	29.9	45.6	16.3	2.2	0.8	0.3	14.85				
Total	4.0	46.0	46.3	3.5	0.2	56.50	0.	2	4.9	30.0	46.0	15.8	2.3	0.5	0.3	14.82				
(b). According to groups																				
1st group (Stages I to III)	9 4	41.0	549	94		56.56	_		6.5	23.7	50.9	17.7	1 2.	-		14.83				
2nd group (Stages of	2.4	11.0	0712	4.1		00.00			0,0	20.1	00.0	27.7	1.2.			17.00				
maturity IV to VIII-II)	4.2	46.9	45.0	3.7	0.2	56.49	0.	2	4.7	31.1	45.2	15.4	2.5	0.6	0.3	14.82				

On the whole the young year-classes (3 to 6 years) were very well represented; they comprised 61.3% of the total as compared with 37.2% in 1949. The year-class 1946 (4-year-old herrings) was by far the best represented with 27.8%.

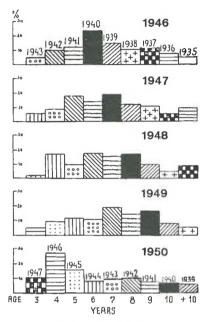


Figure 7. Biological Scale of the Full-Herring Concentrations exploited by the Belgian Herring Trawlers during the years 1946—1950.

The average value of L_1 for the different fishing areas showed little difference; it fluctuated between 108 and 110 mm.

In 1950, the average number of vertebrac was somewhat lower than in 1949—56.50 as against 56.53. This average differed slightly for the different fishing areas and varied between 56.48 and 56.50. This relatively low average number of vertebrae is brought about by the abnormally low average number of 56.56 for the herrings of the first group (herrings with stages of maturity I, II, and III) "spring-spawners" whose average is generally higher e.g. 56.73 in 1949.

In 1950 there was an increase in the number of "spring-spawners", they represented 14.4% as against 5.1% in 1949. As in previous years, this group was totally absent from the catches after October.

As the concentrations were composed largely of the younger year-classes (3 to 6 years), we may assume that the full-herring concentrations exploited by the Belgian herring trawlers underwent an appreciable rejuvenation and that they may turn up in dense concentrations during the next season.

Adverse weather and hydrological conditions as well as an unfavourable economic situation could make for a poor full-herring fishery but, if all these factors turn out to be favourable, we may expect next year's full-herring season to be a fairly good one.

CH. GILIS.

La Pêche Française en Sud de la Mer du Nord et de la Manche orientale.

I. Lieux de pêche.

La campagne d'automne et d'hiver de pêche du hareng 1949/50 débuta vers le 10 Novembre dans les parages du Sandettié (chalutiers) et en même temps le long du littoral du Boulonnais (drifters). L'activité des chalutiers dans la région du Sandettié se poursuivit pendant un mois environ, jusqu'à la mi-Décembre, en donnant de bons résultats dans l'ensemble; la plupart des harengs capturés étaient au stade VI. La pêche artisanale des drifters le long du littoral du Boulonnais devait se prolonger sensiblement plus tard que de coutume (jusqu'à la fin de Janvier). Elle fut marquée par d'assez bonnes et régulières captures de harengs au stade VI. (Un certain nombre au stade VIII en fin de saison).

Le fait à la fois dominant et décevant de la campagne fut l'extrême médiocrité de la pêche du hareng «guai» (stade VIII) qui, durant les précédentes années — avec toutefois une activité décroissante pour les dernières campagnes — s'était localisée sur les bancs des Flandres, le long du littoral Belge et Hollandais, en Janvier et Février principalement. Quelques chalutiers de Boulogne ont opéré dans le secteur du Middelkerque Bank, au large de Nieuport, mais les résultats restèrent pour la plupart peu encourageants (Janvier). Les chalutiers se consacrèrent à la pêche du merlan qui se révéla fructueuse dans les parages du West-Hinder et du North-Hinder à partir de la fin de Décembre, jusqu'en Février. Quelques pêches très sporadiques de hareng guai se firent dans ces régions.

Les conditions hydrologiques au cours de l'automne et de l'hiver ont été caractérisées par une salinité élevée dans le secteur du