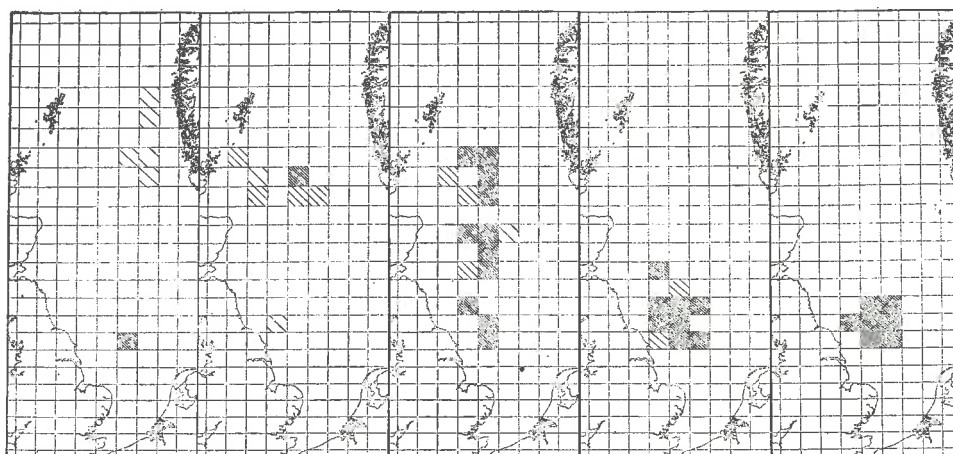


Dutch Catches of Trawled Herring.



Charts 25—29.

March

July

August

September

October



Trawl Fisheries.

The catch of herring per 100 hours fishing of the Dutch steam trawlers fishing with the herring trawl is shown in the Charts 25—29.

The distribution of the fleet shows some differences with 1950. In March rather large catches (of spent herring) have been made in the area near Silver Pit.

The mean catches in the months July, August and September have been about the same as in 1950. The mean catches in October were considerably higher than the year before. This depends partly on the differences in the areas where the fleet has been fishing.

The Table 13 B gives the quantity of herring landed by the trawlers and by the whole fleet fishing with trawl-nets. The total quantity landed was much higher in 1951 than in 1950.

L. K. BOEREMA.

Full-Herring Concentrations exploited by the Belgian Herring Trawlers in 1951.

I. Activity—Landings—Value.

The first full-herring catch was landed on the 23. July 1951, it came from the Fladen Ground. The herring fishery went on there until September, but from mid-September most trawlers were already active in the central area, viz., the Gut and west of this fishing

ground. From October until the beginning of November, the fishery took place still more southerly, especially in the Bruceys Garden and on the western and south-western part of the Dogger Bank. From mid-November until 12. December, the fishery was carried out in the southernmost area of the North Sea, particularly around the lightships "Ruytingen", "Sandettié" and "Dyck".

The numbers of trawlers, voyages etc., catch and value for the years 1946—50 have been summarized in Ann. Biol., Vol. VII, Table 12, p. 139.

Comparing the activity of the herring trawlers with the season 1950, we must admit a slight decrease in 1951. The number of trawlers which have taken part in the campaign fell from 40 to 38; the number of voyages however increased from 213 to 215, whereas the number of H.P. developed-fishing hour decreased from 6,493,488 to 6,277,371, being a decrease of 216,117 H.P. developed-fishing hour, or 3.3%.

The total landings were 5,794 tons against 7,555 in 1950, this means a decrease of 23%.

The average catch per voyage also shows a marked diminution from 35 tons to 27 tons, or 24%.

The average catch per hour's fishing for 100 H.P. developed is also lower, 92 Kg. against 116 Kg. in 1950, being 21% less. This decrease

Table 14. Number of Belgian Herring Trawlers (T), of Voyages (V), of Sea-Days (S.D.) and of Effective Fishing Hours (F.H.)

Fishing Grounds and Months		according to Classes of Vessels and Fishing Grounds.																			
		Class III		Class IV		Class V		Class VI		Total		Class III		Class IV		Class V		Class VI		Total	
		T	V	T	V	T	V	T	V	T	V	S.D.	F.H.	S.D.	F.H.	S.D.	F.H.	S.D.	F.H.	S.D.	F.H.
North Sea, North																					
July.....		—	—	3	3	3	3	2	2	8	8	—	—	36	553	27	329	21	242	84	1,124
August.....		—	—	6	7	4	5	4	8	14	20	—	—	77	890	56	621	81	970	214	2,481
September..		—	—	1	1	2	2	3	3	6	6	—	—	12	135	21	316	28	313	61	764
Total.....		—	—	6	11	7	10	4	13	17	34	—	—	125	1,578	104	1,266	130	1,525	359	4,369
North Sea, Central																					
August.....		—	—	7	9	4	5	1	1	12	15	—	—	105	1,105	52	569	11	112	168	1,786
September..		—	—	7	13	6	14	4	5	17	32	—	—	114	1,107	131	1,257	49	474	294	2,838
October.....		—	—	4	12	8	16	2	4	14	32	—	—	99	990	128	1,259	31	296	258	2,545
November..		—	—	3	3	6	6	1	1	10	10	—	—	31	297	61	677	10	80	102	1,054
Total.....		—	—	9	37	8	41	6	11	23	89	—	—	349	3,499	372	3,762	101	962	822	8,223
North Sea, South																					
November..		11	42	4	14	2	4	1	2	18	62	207	1,560	49	366	25	229	11	108	292	2,263
December..		9	25	2	5	—	—	—	—	11	30	95	778	21	94	—	—	—	—	116	872
Total.....		11	67	4	19	2	4	1	2	18	92	302	2,338	70	460	25	229	11	108	408	3,135
Seasonal Total		11	67	12	67	8	55	6	26	37	215	302	2,338	544	5,537	501	5,257	242	2,595	1,589	15,727

The average duration of a voyage was 7.38 sea-days or 73.15 fishing hours.

denotes that an equal effort produced by the trawlers gave a smaller catch than in 1950. From this we may infer that the herring concentrations exploited by the Belgian fishermen during 1951 were not so dense as during the previous year. However, this conclusion does

not apply to the northern area, since the average catch for one hour's fishing for 100 H.P. developed reached a much higher level, 73 Kg. against 64 Kg. in 1950.

The value of the herring catch reached 21.6 mill. fr. being 12% less than in 1950.

Table 15. Total Weight landed (in 1000 Kg.) and the Average Catch per Voyage (C/V) in 1000 Kg. and per Hour per 100 H.P. (C/H) (in Kg.).

Northern section	Class III		Class IV		Class V		Class VI		Total		Class III		Class IV		Class V		Class VI		Total		
	C/V	C/H	C/V	C/H	C/V	C/H	C/V	C/H	C/V	C/H	C/V	C/H	C/V	C/H	C/V	C/H	C/V	C/H	C/V	C/H	
July.....	—	—	35	—	70	—	121	—	226	—	—	—	12	22	23	51	61	59	28	45	
August.....	—	—	180	—	241	—	669	—	1090	—	—	—	26	70	48	97	84	79	54	81	
September....	—	—	19	—	55	—	271	—	345	—	—	—	19	47	28	48	90	99	58	80	
Total.....	—	—	234	—	366	—	1061	—	1661	—	—	—	21	51	37	73	82	80	49	73	
Central section																					
August.....	—	—	222	—	212	—	99	—	533	—	—	—	25	67	42	93	99	104	36	82	
September....	—	—	420	—	604	—	420	—	1443	—	—	—	32	131	43	119	84	120	45	122	
October.....	—	—	481	—	699	—	323	—	1502	—	—	—	40	181	44	135	81	176	47	156	
November.....	—	—	64	—	114	—	50	—	228	—	—	—	21	72	19	40	50	129	23	56	
Total.....	—	—	1187	—	1629	—	891	—	3707	—	—	—	32	118	40	106	81	134	42	116	
Southern section																					
November.....	175	—	63	—	57	—	45	—	340	4.2	51	4.5	66	14	57	23	56	5.5	55	—	
December.....	69	—	17	—	—	—	—	—	86	3.8	49	3.3	72	—	—	—	—	2.9	52	—	
Total.....	244	—	80	—	57	—	45	—	426	4.6	50	4.2	67	14	57	23	56	4.6	54	—	
Seasonal Total.	244	—	1501	—	2052	—	1997	—	5794	3.6	50	22	95	37	96	77	96	27	92	—	
Percentage.....	4.2	—	25.9	—	35.4	—	34.5	—	100	—	—	—	—	—	—	—	—	—	—	—	

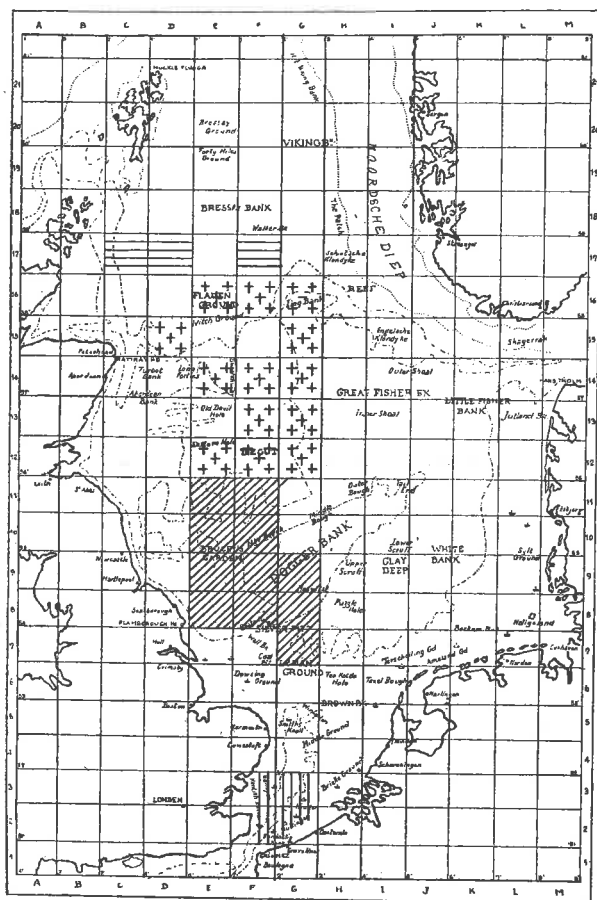


Figure 9. Fishing grounds exploited by Belgian herring trawlers in 1951.

II. Biology.

The material comprises 15 samples of which 7 were from the northern area, mainly the Fladen Ground and Long Forties, and 8 from the central area, Bruceys Garden as well as west and south-west of the Dogger Bank. The former area was fished mostly during August and the latter during September and October.

The average length of the herring was:—

	Northern area	Central area	Both areas
in 1951.....	276 mm.	261 mm.	267 mm.
in 1950.....	263 —	257 —	261 —

Table 16. Catch of Full Herring in the Season.

	Total 1000 Kg.	%	Per voyage in 1000 Kg.	Per eff. hour per 100 H. P. in Kg.
July.....	226	3.9	28	45
August.....	1623	28.0	46	81
September....	1788	30.9	47	111
October.....	1502	25.9	47	155
November....	569	9.8	8	55
December....	86	1.5	3	52
Total.....	5794	100	27	92

The average length increased slightly in the two areas. The average weight is also somewhat higher, 162 gr. against 155 gr.

Comparing the numerical strength of the year-classes observed, we ascertained that the youngest generations (three to six-year-old herrings) although they were already very well represented in the 1950 concentrations were still better represented this year: 68.2% against 61.3%.

The average number of vertebrae for the northern area was 56.62 that for the central area 56.51 and for the two areas 56.55.

Table 17. Average Numbers of Sea-Days and of Effective Fishing Hours per Voyage.

	Sea-days	Fishing hours
Northern....	10.6	128.5
Central.....	9.2	92.4
Southern....	4.4	34.1

The average number of vertebrae of the herrings, which during August belonged to the maturity stages I to III, and which we consider to be spring spawners, was 56.81 and for those with maturity stages IV to VIII—II + stages I to III from September, considered to be autumn spawners, 56.51.

The spring spawners represented 34.5% of the catch in the northern area; they are totally missing in the catches from the central area. This result corroborates once more the fact

Table 18. Total Seasonal Weight in 1951.

	Weight (1000 Kg.)	Percentage
Herring.....	5794	89.5
Mackerel.....	334	5.2
Demersal fish..	344	5.3
Shellfish.....	2	0.04
Total.....	6474	100

Table 19. Full Herring. Length, Weight, Sex, Maturity, Fat Content, and Age (Percentages).

A. Centimetre Class, Mean Length (cm.), Average Weight (gr.), and Sex (Percentages).

	Centimetre Classes												Aver. Males			
	19	20	21	22	23	24	25	26	27	28	29	30	31	Mean Weight	%	
Northern...	—	—	—	—	0.3	1.8	11.2	19.2	22.0	29.7	11.5	4.0	0.3	27.6	179	52
Central...	0.2	0.3	0.3	0.9	6.4	11.0	24.8	26.7	18.2	7.0	3.7	0.3	0.2	26.1	151	48
Total.....	0.1	0.2	0.2	0.6	4.0	7.5	19.6	23.9	19.6	15.7	6.7	1.7	0.2	26.7	162	50

B. Stages of Maturity and Quantity of Mesenteric Fat.

	Stages of Maturity							Quantity of Fat			
	I	II	III	IV	V	VI	VIII-II	0	1	+	M
Northern.....	4.0	2.8	27.7	38.7	26.8	—	—	3.5	24.5	38.5	33.5
Central.....	2.2	3.4	5.9	23.1	36.8	16.8	11.8	23.8	39.4	25.9	10.9
Total.....	2.9	3.2	14.2	29.1	33.0	10.3	7.3	16.0	33.7	30.8	19.5
1. group.....	11.6	8.0	80.4	—	—	—	—	0.7	0.7	17.4	81.2
2. group.....	1.6	2.4	4.2	33.5	38.0	11.9	8.4	18.3	38.7	32.8	10.2

C. Distribution of Year-Classes and Age-Groups.

Number of Herrings with readable scales: 233.

	Number of Herring with readable scales: 233.										Number of	
	2	3	4	5	6	7	8	9	10	+	1941 Before	1941 Samples
Winter-Rings.....	2	3	4	5	6	7	8	9	+			
Age (Years).....	3	4	5	6	7	8	9	10	+			
Year-Classes.....	1948	1947	1946	1945	1944	1943	1942	1941	Before 1941			
Northern.....	2.4	10.6	20.0	20.0	15.3	9.4	7.0	8.2	7.1	7	400	
Central.....	4.0	19.6	36.5	16.9	5.4	3.4	6.8	4.0	3.4	8	644	
Total.....	3.4	16.3	30.5	18.0	9.0	5.6	6.9	5.6	4.7	15	1044	

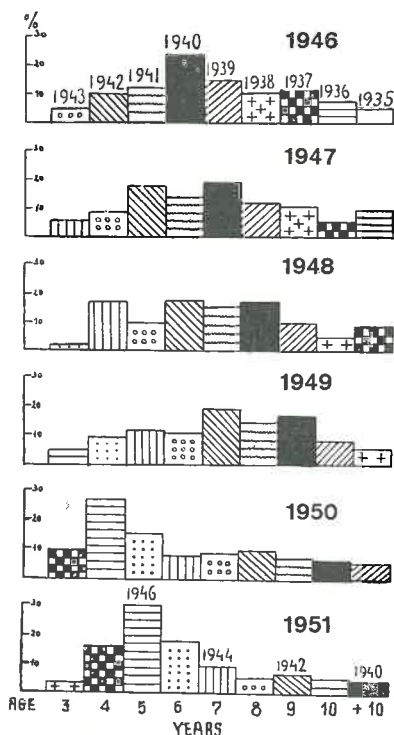


Figure 10. Biological Scale of the Full-Herring Concentrations exploited by the Belgian Herring Trawlers during the years 1946—1951.

that the spring spawners penetrate the central area of the North Sea only in small numbers.

In 1950, the spring spawners represented 41.4% of the catch from the northern area.

As is normal, the average number of keeled scales was somewhat higher for the autumn spawners than for the spring spawners, or respectively 14.70 and 14.67.

Stomach Contents.

Among the 1,044 stomachs examined only 81, or 7.8%, were found to have some contents: 17, or 1.6%, full; 32, or 3.1%, half-full and 32, or 3.1%, a quarter full.

The contents observed consisted for the greater part of copepods and smaller quantities of schizopods.

III. Forecasts for the Full-Herring Campaign 1952.

If we analyse the composition of the last fished full-herring concentrations (1951), we ascertain that the three-year-old herrings (year-class 1948), which joined the full-herring concentrations for the first time, were only very poorly represented (3.4%). On the other hand, the five-year-old herrings (year-class 1946) were exceptionally well represented (30.5%). The four-year-olds (year-class 1947) and the

Table 20. Full Herring. Average Length and Average Value of L_1 of each Year-Class.

Born in:.....	Length of Year-Classes, cm.									L_1 of Year-Classes, in mm.								
	1948	1947	1946	1945	1944	1943	1942	1941	1940	1948	1947	1946	1945	1944	1943	1942	1941	Mean
Age:.....	3	4	5	6	7	8	9	10										
Northern.....	23.9	26.3	26.8	27.2	28.0	28.6	28.1	28.5		100	110	114	108	114	133	112	115	114
Central.....	24.3	25.8	26.5	27.2	27.6	27.6	27.6	28.5		119	116	108	112	101	108	107	110	111
Total.....	24.2	25.9	26.6	27.2	27.9	28.2	27.8	28.5		114	115	109	110	109	123	109	113	112

six-year-olds (year-class 1945) were well represented (16.3% and 18.0% respectively).

Relying upon the above-mentioned percentages, we may expect that the 1948 year-class will not be well represented in the next nor in the later concentrations, whereas the 1947, 1946 and 1945 year-classes will always assure a large share until they reach an old age.

However, to infer from this that the coming season will yield large catches, would be to judge prematurely.

As is being constantly pointed out, good catches do not depend solely on the density of the concentrations, but rather upon the weather and hydrological conditions, which occur during the campaign. Also, it would not be the first time that the exploitation of the concentrations was adversely affected by them and in this way belie the favourable forecasts of a campaign.

In consequence, it is only if the weather and the hydrological conditions affect the exploitation favourably that we may expect, in 1952, a satisfactory full-herring season.

CH. GILIS.

Spent-Herring Concentrations on the Belgian and French Coasts, 1951—52.

A. Fishery.

I. Period, Fishing Grounds and Methods.

The spent-herring season 1951—52 was of longer duration than the previous one. The

first catches were landed on 12. December 1951 and the last on 29. February 1952. During this period there were 61 days of sale, viz., 18 in December, 21 in January and 22 in February. The previous campaign started 6 days earlier, but finished also a month sooner (from 6. Dec. till 27. Jan.) and counted only 42 days of sale.

As in 1950—51, it was only at the beginning of the season that dense spent-herring concentrations were to be found in the Belgian territorial waters. As from January, the spent-herring left once and for all the Belgian waters and from then onwards the Belgian trawlers were active in the areas between the light-vessels "Ruytingen" and "Dyck" as well as in areas further north.

Concerning the fishing methods, it must be mentioned, that in contrast with the previous season, the fishery with the "bull-net" again met with great success and this time both among the largest and the smallest trawlers.

II. Activity of the Herring Fleet and Catch.

A total of 52 trawlers took part in the spent-herring campaign 1951—52, or 15 less than during the previous season:—

Class	Number		Type	H.P.
	1950-51	1951-52		
I	13	6	shrimp boats.....	— 79
II	21	8	coastal trawlers.....	80—119
III	27	29	medium-sized trawlers .	120—239
IV	6	9	small deep-sea trawlers	240—300

Table 21. Full Herring. Racial Characters. Percentage Distribution and Means.

Origin	Number of Vertebrae ¹⁾						Average	Number of K_2								Average
	55	56	57	58	59	60		11	12	13	14	15	16	17	18	
Northern...	2.3	41.9	47.7	7.9	0.2	56.62	—	0.2	5.8	35.5	44.5	11.5	2.3	0.2	14.69	
Central....	5.8	41.2	49.0	4.0	—	56.51	0.2	0.2	6.3	34.1	44.1	13.5	1.1	0.5	14.69	
Total.....	4.4	41.5	48.5	5.5	0.1	56.55	0.1	0.2	6.1	34.7	44.3	12.7	1.5	0.4	14.69	
1. group...	2.2	30.2	52.9	14.0	0.7	56.81	—	0.7	8.7	31.2	44.2	13.0	1.5	0.7	14.67	
2. group...	4.8	43.2	47.8	4.2	—	56.51	0.1	0.1	5.7	35.2	44.3	12.7	1.6	0.3	14.69	

¹⁾ The census for the vertebrae covered 1,044 spines, of which there were 27, or 2.59%, with one or more fused vertebrae. These spines have been eliminated from our material.