

Conseil International pour l'Exploration  
de la Mer

C.M. 1953  
Contribution No.  
(North Sea Sub-Committee  
Comparative Fishing Committee)



Some Trials of Seines and Trawls in 1953

By

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The preceding papers consist of a review by Graham *et al* and an account of girth measurements of haddock by Margetts. The first concludes that there is an overall difference in the selective effect of the two gears, with the seine liberating relatively larger fish than does the trawl. That conclusion seems firm for plaice, and some evidence was given of a similar effect for haddock. With the help of the second paper it is now possible to examine recent English work on haddock.

In August 1953 the SCANLORD of Grimsby used alternately seine nets of 73 and 82 mm mesh respectively, these being the average meshes in the cod-ends of each net. (Table 1). It is seen in Figure 1 and Table 2 that the catches of the larger meshed net become 50% of the smaller mesh net at approximately 35 cm length. This will be taken as an approximation of the "50% point" as defined in the first of the preceding papers. (Two errors are involved, and these would act in opposite directions: had the two nets been fishing equally well, the true point would be above that shown by this comparison, because some 35 cm fish doubtless escaped even the 73 mm net; but this would be compensated at any rate partly. It was discovered at the end of the voyage that the 82 mm net was set up rather more tightly than the 73 mm net, which would be expected to reduce its efficiency a little, so that it ought to have caught a few more fish of 35 cm length to balance those few presumed to have escaped from the 73 mm mesh, see Table 3).

Turning to the Figure in Margetts' paper, it can be seen that 34.4 cms is approximately the length lying on Graph 2 at the level of 168 mm girth, which is the internal measurement of an 82 mm net. Considering how lively the fish are in a seiner's catch, it seems reasonable that they should have a 50% chance of getting through at the degree of constriction represented by Graph No. 2, obtained as described by Margetts.

If it is accepted that the SCANLORD's comparison fits Margetts' Graph No. 2 the comparable 50% point of an 80 mm mesh will be approximately 33 cms. This is substantially above that for the trawl i.e. a 50% point of 26 cm. (Beverton and Holt's analysis of Davis' data, in Press). The difference in size, shown in Figure 2, is striking. Returning to Margetts' Graph No. 2, it can be found that a 26 mm haddock would appear to fit a seine mesh of 125 mm, internal measurement, that is a 60 mm mesh. This, however, assumes that the smaller fish would be as strong as the larger, which one would not expect.

The results of directly comparing the length frequencies taken by the seiner SCANLORD and the trawler SIR LANCELOT, fishing as near to each other as they could, are given in Table 4, which includes comparable hauls in which the mesh used by the SCANLORD was 74 mm and that used by the SIR LANCELOT 75 mm. It is to be observed that the seiner caught altogether much fewer fish than the trawler, and that the deficiencies were mainly among the larger sizes of fish. Two processes may have contributed to the differences found. The crew of the SCANLORD were strange to the practice of "fly-dragging", which is the typical method of operation when haddock fishing, and may thereby have lost larger fish disproportionately. The seine may also have taken very small fish disproportionately, because in the short period of a seine's operation these might not have had the same opportunity to find the wall of net as they would have in the longer tow of a trawl. Owing to the possibility of the first of these two processes having operated in this trial, the data cannot fairly be considered as typical of haddock seining and will not be used further.

More reliable comparisons of trawler and seiner are available from the work of the ELIZABETH CRAWFORD and the PLATESSA during September, 1953.

PLATESSA, using 79 mm and 90 mm trawls, fished against the ELIZABETH CRAWFORD of Berwick using 72 mm and 81 mm seines. The data for the first three days work on two grounds, one 20 miles off Berwick in 43 fathoms and

and the other 6 miles off Berwick in 38 fathoms, are shown in Tables 5 and 6, and plotted in graphs in Figures 3 and 4.

The seiner data are for equal fishing time, the nets being fished alternately for eight pairs of hauls; they confirm sufficiently nearly the SCANLORD's results on the 50% selection point of the 81 mm seine being in the region of 35 cm. length of haddock.\*

The trawler's fishing was matched with the seiner's in order primarily that the length distributions of the haddock caught by the two trawls could be compared with those of the haddock caught by the two seines. The trawler data represent five hauls with the 79 mm net and six hauls with the 90 mm net made approximately alternately; they are thus only roughly comparable quantitatively between the two trawl mesh sizes, but the apparent trawl mesh selection level indicated is not out of keeping with the results of other work on trawls.

It will be remembered that Graham et al used the median as perhaps the fairest single index of length distribution in comparisons. The figures for the present series are:-

	<u>Mesh</u>	<u>Median length of Haddock</u>
ELIZABETH CRAWFORD Seine	72 mm.	26.4 cm.
PLATESSA Trawl	79 mm.	26.9 cm.
ELIZABETH CRAWFORD Seine	81 mm.	33.4 cm.
PLATESSA Trawl	90 mm.	33.1 cm.

(Data for the last two days' work of this cruise are still to be reported on).

These figures show close similarity between the haddock caught in a 72 mm seine and a 79 mm trawl, and also between those of haddock caught in a 81 mm seine and 90 mm trawl. Inspection of the graphs in Figures 3 and 4 gives the same impression. The new results therefore confirm the conclusion from the PRIMULA/PLATESSA trial, which found in haddock about the same relation as has been shown for plaice: that a seine catches a run of fish approximately the same as a trawl of mesh 10 mm greater.

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\* As in all comparative fishing work a proportion of hauls was abortive - damaged gear, etc. All of the SCANLORD's and ELIZABETH CRAWFORD's hauls that could be used as comparable pairs have been used in making the relevant tables.

TABLE 1 - Codend Mesh Sizes

Ship	Gear	Mesh Sizes <b>daily</b>					Average
Scanlord	Large meshed seine	81.0	81.3	82.9			81.7
Scanlord	Small meshed seine	71.8	73.3	73.5	72.9	74.7	73.2
Sir Lancelot	Trawl	75.2	76.6	74.8			75.5
E. Crawford	Large meshed seine	80.4	81.6	81.3	81.4		81.17
E. Crawford	Small meshed seine	72.3	72.0				72.15
Platessa	Large meshed trawl	79.05	78.45	78.85	78.15		78.62
Platessa	Small meshed trawl	90.1	89.05	90.05	89.3		89.60

TABLE 3 - Setting up of seine nets -  
M. S. Scanlord

In this table the tightness with which the net was found to be stapled onto the ropes after shrinkage and use is expressed as the average number of fully stretched mesh between adjacent staplings. (Two fully stretched meshes between staplings indicates that the netting is tight and no "flow" is allowed).

	82 mm. Net		73 mm. Net	
	Headline	Groundrope	Headline	Groundrope
Wings	1.84	1.81	1.79	1.75
Shoulders	1.97	1.92	1.72	1.62

## 73 MM. MESH CODEND

## 82 MM. MESH CODEND

Haul	16	19	23	26	28	30	32	38	40	42	Total	17	20	24	25	27	29	31	39	41	44	Total	
th (Fms.)	33	38	34	33	34	35	35	37	37	40		32	41	32	32	34	35	35	36	37	40		
Length cms.																							
19	1										1												1
20			1	1				1			3			1									1
21	2		4	4		9	1	1		1	22	1		2				2					5
22	19	2	9	2	1	21	3	7	2	14	80	8		2	3		2	2	1				18
23	50	3	43	17	3	59	11	9	1	25	221	21		5	5		1	6	5	1	2		46
24	114	3	60	23	2	134	21	14	7	36	414	26		13	9	3	1	4	3	2		2	61
25	129	3	82	24	4	153	35	8	7	54	499	28		16	5	1	4	5	2	1	2		64
26	78	5	63	21	1	128	22	8	7	27	360	27		21	3		2	1	3		1	1	58
27	55	1	36	15		75	8	2	4	18	214	5		8	3				4	1		1	21
28	39		16	12		40	4		3	7	121	4		5	1	1		1	2	1	1	1	16
29	31		6	11		40	3		1	2	94	5		6	3	1	2	1	1				18
30	57	2	14	12	1	49	10	3	2	4	154	4	1	8	4		1	2	2	1	2	2	25
31	46	3	19	12	1	39	9	2	6	3	140	1		11	4		1		3	1	1	1	22
32	31	3	19	12		32	7	1	3	5	113	5		10	1			1	4	2			23
33	31	1	15	6		27	3	1	6	8	98	1		10	1				4	1	1	1	18
34	9		5	9		10	3	14	6	7	63			14	1	1			6	2	3	3	27
35	13	1	5	3		13	1	4	3	1	44	2		5					6	3	5	5	21
36	5		3	3		2	1	4	1	3	22	1		7			1		10	1	7	7	27
37	3		1	3		4		3	3	5	22			2					6	3	3	3	14
38	3			1		2		1		3	10			1					4	1	1	2	8
39				1		1					2	1		2					1	1		2	7
40				2					1		3	1		1					2				5
41				2				1			3	1								2			3
42	1										1			2									2
43						1					1												1
44	1										1			1									1
45																							
46								1			1												
47																							
48																							
49																							
50																							
51																							
52																							
53																							
54																							
Total	718	27	401	196	13	839	142	85	63	223	2,707	142	1	153	44	7	15	25	68	24	32		511
Mean	26.6	26.5	26.0	27.4	25.1	26.3	26.0	26.3	29.5	25.7	26.3	25.5	30.5	29.6	26.0	25.5	25.9	24.6	34.2	34.5	35.6		27.1

TABLE 4

CATCHES OF HADDOCK BY SEINER USING 73 MM. MESH  
AND TRAWLER USING 75 MM. MESH  
MORAY FIRTH, AUGUST 1953.

Length Cm.	Seiner	Trawler
	S.S. "Scanlord" Stations 10,12,14,16,19,21, 23,26,28,30,32.	"Sir Lancelot" Stations 5/11, 18/29
18		2
19	1	
20	4	6
21	26	22
22	79	93
23	243	234
24	460	525
25	559	666
26	442	471
27	274	340
28	164	270
29	138	343
30	244	453
31	255	374
32	200	419
33	183	315
34	92	241
35	66	191
36	35	127
37	17	106
38	16	53
39	3	60
40	7	40
41	4	17
42	2	18
43	3	15
44	1	15
45	-	15
46	-	6
47	-	9
48	-	6
49	-	4
50	-	9
51	-	1
52	-	3
53	-	1
54	-	2
55	-	3
56	-	3
57	-	1
58	-	-
59	-	1
60	-	1
61	-	-
62		1
Total	3,518	5,482
Median	26.9	29.3

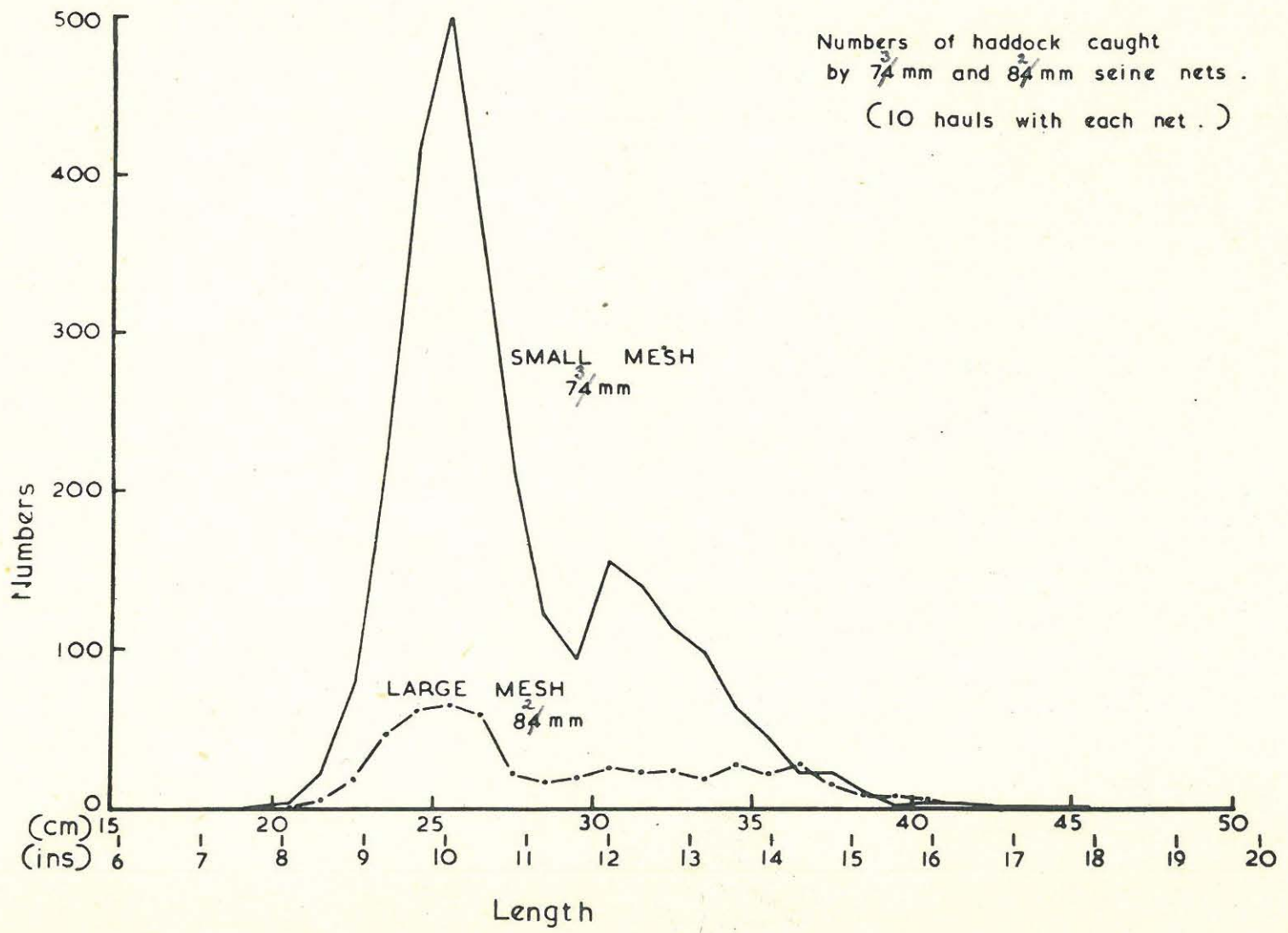


TABLE 6  
Catches of haddock by trawler and seiner fishing on the same grounds  
September, 1953

Length cm.	Seiner Elizabeth Crawford		Trawler Platessa	
	72mm. mesh	81mm. mesh	79mm. mesh	90mm. mesh
19	1	1		
20	4	1		
21	30	4	3	
22	76	2	17	5
23	227	13	56	14
24	378	32	123	28
25	506	40	178	28
26	445	39	161	42
27	228	29	79	22
28	107	12	49	6
29	46	8	28	6
30	50	5	32	12
31	76	10	35	21
32	90	11	47	28
33	128	19	46	45
34	105	27	58	55
35	104	38	38	52
36	84	47	43	33
37	67	34	16	18
38	38	26	7	9
39	24	18	7	4
40	6	6	4	1
41	1	3		
42	2	1		
43	2			
44				
45	1		1	
46		2		
47				
48		1		
49	1	1		
50			1	
Total	2827	430	1029	429
Median	26.4	33.4	26.9	33.1



Fig. 1.  
from Table 2



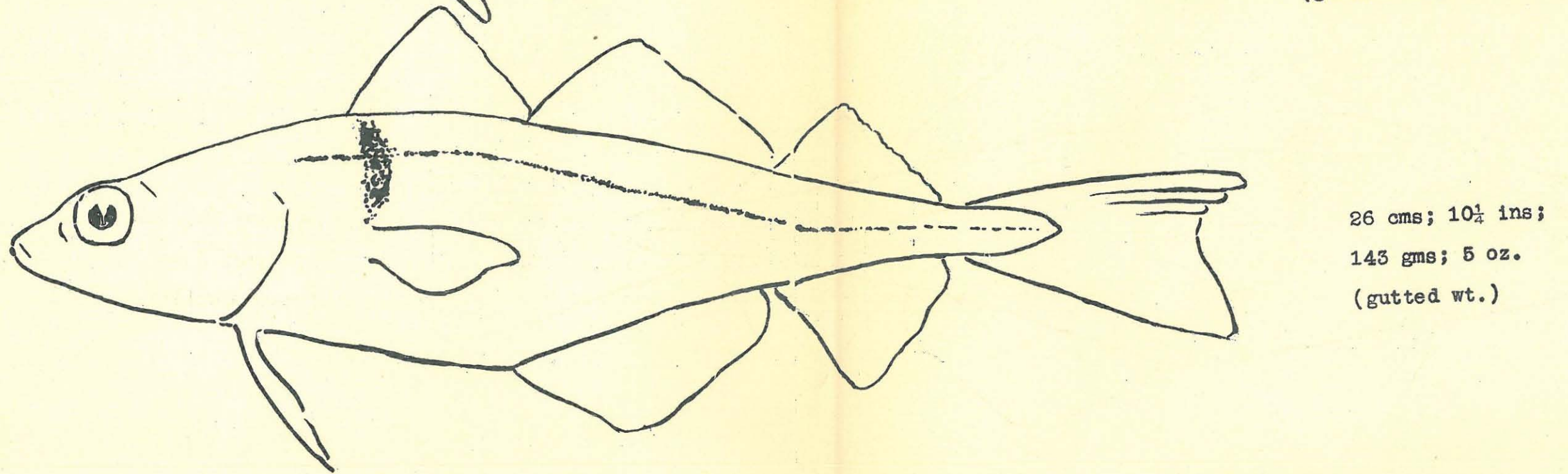
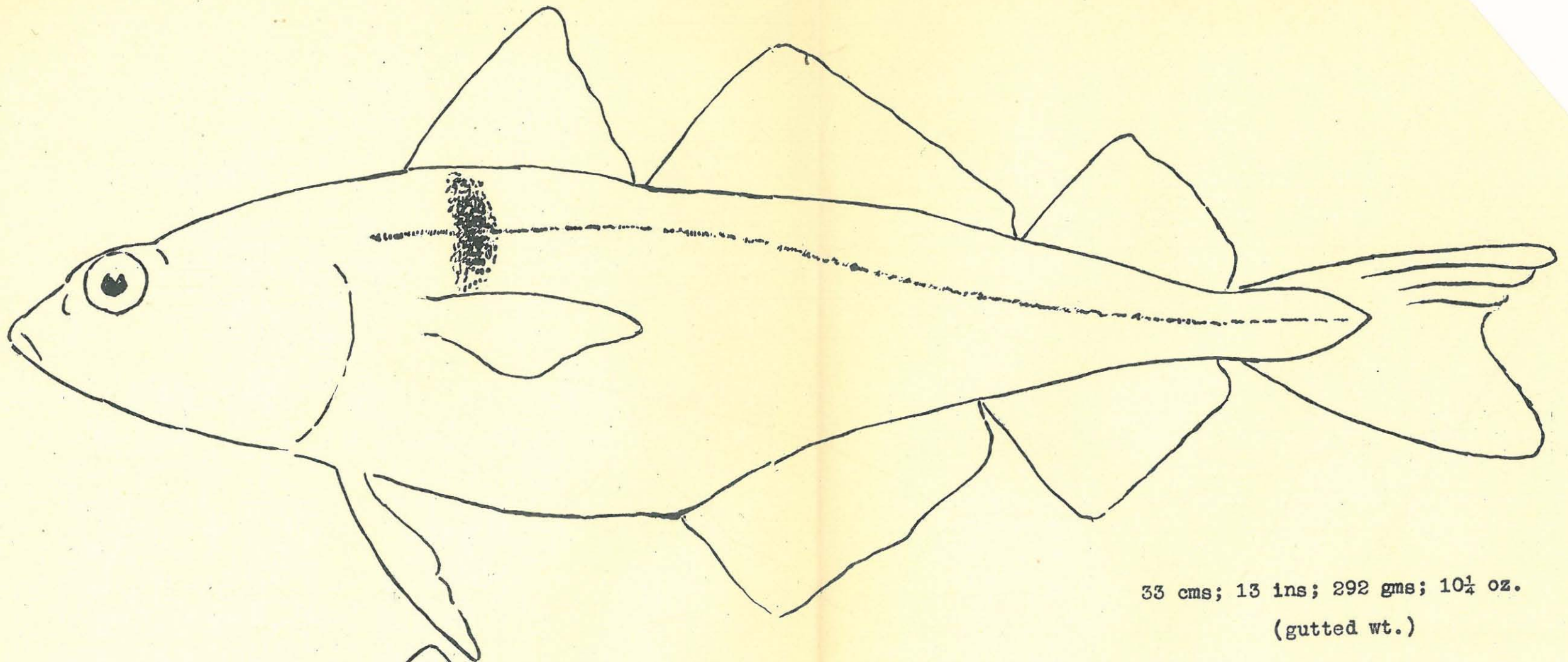


FIG. 2. SIZE OF HADDOCK WITH A 50:50 CHANCE OF ESCAPE IN SEINE AND TRAWL OF 80mm MESH

NUMBERS OF HADDOCK CAUGHT BY 72 mm SEINE NET (above) AND 61 mm SEINE NET (below). (8 HAULS WITH EACH NET)

MEDIAN SHOWN BY DOTTED LINE

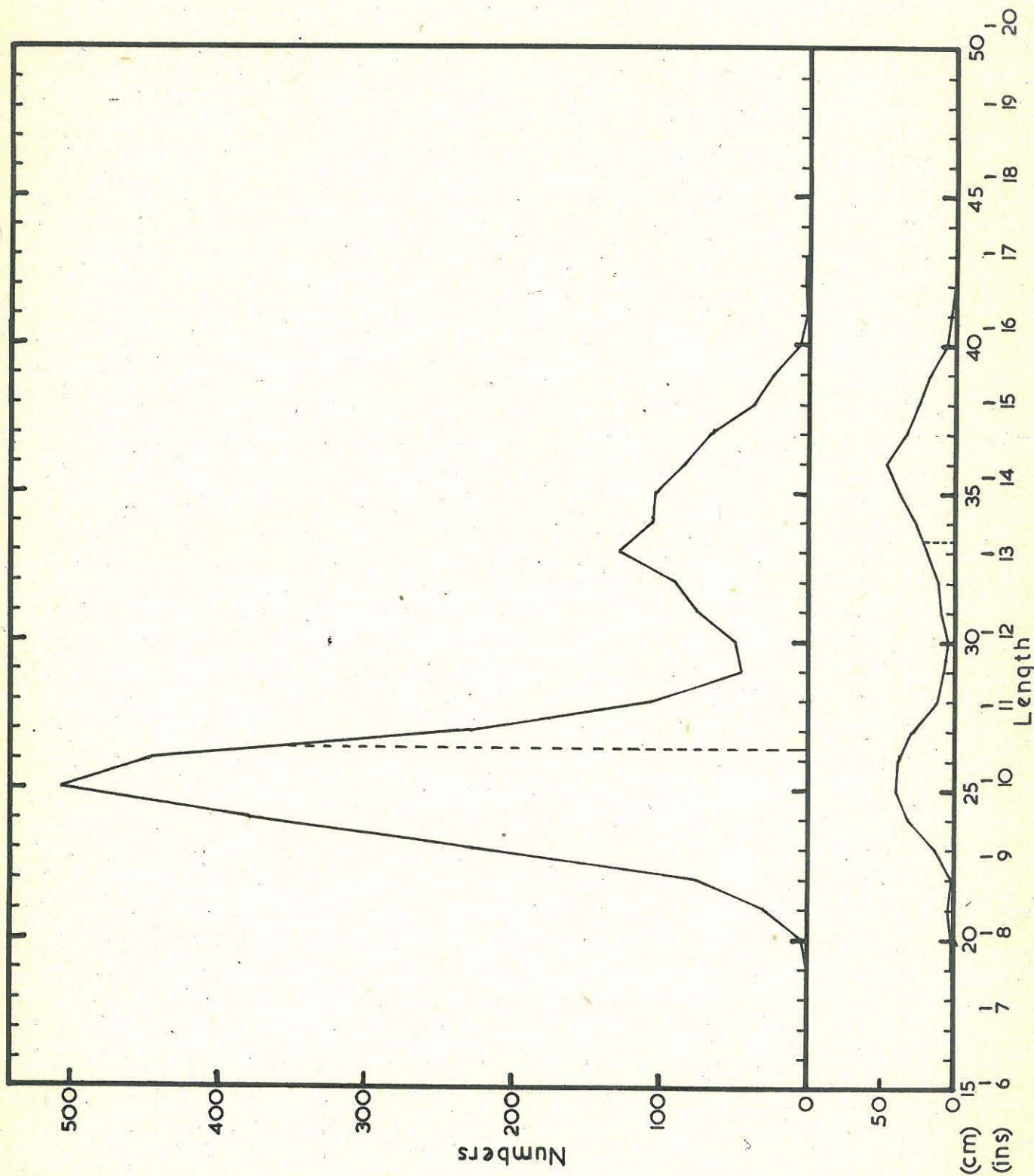


Fig. 3.  
from Table 5

NUMBERS OF HADDOCK CAUGHT BY 79 mm TRAWL (above) AND 90 mm TRAWL (below). MEDIAN SHOWN BY DOTTED LINE

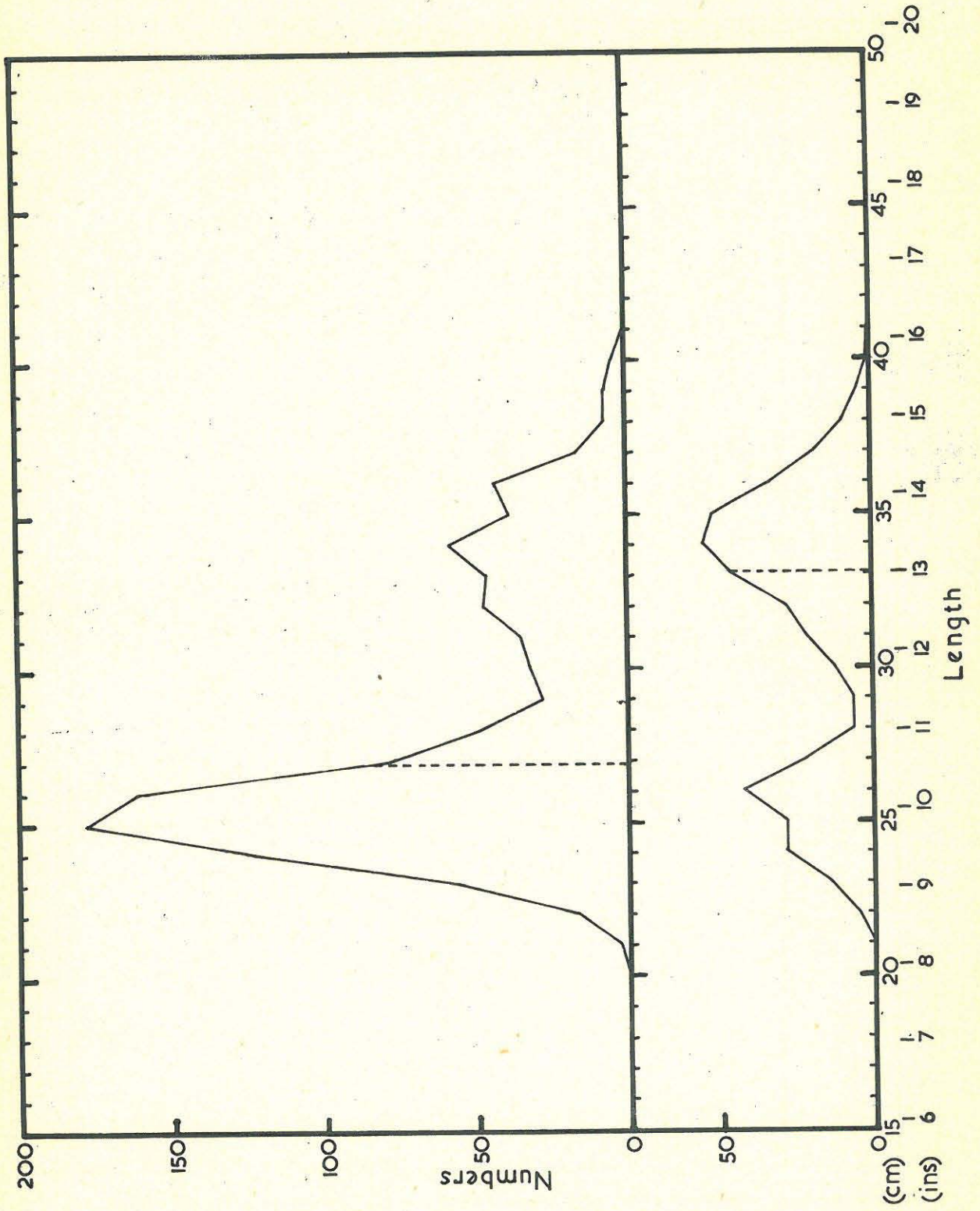


Fig. 4.  
from Table 6