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REPORT ON THE INTERNATIONAL WHITING SURVEYS OF THE NORTH SEA:
PRELIMINARY RESULTS FROM THE 1961 CRUISES

by

R. Gambell and D. Sahrhage
on behalf of the working group.

Havsfiskelaboratoriet
Lysekil.

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Introduction

The whiting data collected during the international herring surveys of the North Sea during the spring and autumn of 1960 were presented by a working group to the ICES meeting of 1961 (Near Northern Seas Committee, paper no. 46). This present paper describes the preliminary results from the cruises during 1961, and a final report combining the data from the two years is submitted as paper no. 5.

The working group consisted of:

D. Sahrhage	(Germany)	Convener
R. Gambell	(Scotland)	
D. Garrod	(England)	replacing D. Rout
L. Hannerz	(Sweden)	
H. Knudsen	(Denmark)	
K. Kuiten	(Netherlands)	replacing M. Roessingh
J. Messtorff	(Germany)	

Data available

In March and April 1961 the surveys were carried out by "Willem Beukelsz" (Netherlands), "Dana" (Denmark), "Anton Dohrn" (Germany) and "Scotia" (Scotland). These vessels were joined by the "Skagerak" (Sweden) for the September-October cruise. The total catches per one hour of trawling are shown in figs 1 and 2. The data collected were similar to that recorded in 1960, and were used for calculating mean catches and lengths per year class per statistical rectangle.

Standardization of data.

The catches made in the same areas by pairs of vessels were compared, and after consultation with Mr. J. Pope of the comparative Fishing Committee, it was concluded that the following fishing powers with respect to whiting (table 1) were the best obtainable for the data.

Table 1. Fishing powers of research vessels

Spring 1961		Autumn 1961	
Willem Beukelsz	1	Willem Beukelsz	2
Dana	8	Dana	3
Anton Dohrn	8	Anton Dohrn	3
Scotia	1	Scotia	1
		Skagerak	9

The reasons for the changes in the factors between the same vessels in different cruises, both in 1961 and 1960, are not known. There was no evidence of any changes in the gears used between cruises, but variable weather conditions and depths fished, may be involved.

Distribution and density of whiting

Unfortunately it was not possible to sample as many rectangles in 1961 as in 1960, and the intensity of sampling was also rather unevenly distributed over the area. The total catches made in each rectangle are shown in figs. 3 and 4.

a. Spring.

Figs. 5-8 give the distribution of the individual year classes. The 1960 year class (I-group) were found in three main concentrations, the Scottish coastal area, the Great Fisher and Schlick Banks, and in the Skagerak. They were very poorly represented in the deep water of the extreme north western North Sea. The older fish, by contrast, were relatively more abundant in the northern and southern parts of the area, and this can be seen clearly in the percentage age composition diagram (fig. 9).

b. Autumn.

The distributions of the various year classes in the autumn are shown in figs. 10-14. The highest numbers of the 1961 year class (O-group) were found in the Skagerak, Schlick Bank, Fladen and North Shields areas. The percentage age composition diagram (fig. 15) also shows that they were widely distributed over the North Sea. Again the older fish were concentrated in the two areas of the northern and southern parts of the North Sea, but it is not possible to say anything about the unsampled region between the two.

Mean lengths of whiting.

Figs. 16-18 show the mean lengths of the various year classes of whiting in the spring, and figs. 19-21 the mean lengths for the same year classes in the autumn. No O-group data are presented, because they showed a strong correlation with sampling vessel. Both the spring and autumn data show that there

was an increase in mean length for all year classes (I-III group) from the south eastern area to the north western,

Comparison of whiting in selected areas.

Six areas, shown in fig. 22, were chosen for special analysis. The length compositions are given in fig. 23 and the age compositions in fig. 24.

Except for the most northerly area (A.), catches in the autumn were generally larger than in the spring. The length compositions show that in the spring, by comparison with the older fish, the 1960 year class (I-group) was more abundant in the Skagerak and central North Sea (areas D and F). The spring catches in the most westerly areas (A, B and C) were of generally older fish. The increase in modal length in the autumn in the three most northern areas (A, B and D), can be attributed to growth, although the catches in area A were very small. In the three southern areas (C, E and F) there were some changes in the age composition between the sampling periods. In C there were more I-group and fewer III-group fish in the autumn than in the spring, causing a reduction in the modal length; the modal length for E in the autumn was influenced by an increased proportion of I-group whiting, while in area F this age group was reduced in importance. The central and south eastern areas (E and F) contained the highest proportion of the new 1961 year class (0-group) in the autumn.

The mean lengths of each year class of whiting in areas A-F in spring and autumn are shown in tables 2 and 3.

Table 2. Mean lengths of whiting year classes in areas A-F, spring 1961 (figures in brackets are based on less than 10 fish)

Year class age group area	1960 I	1959 II	1958 III	1957 IV	1956 V	1955 VI
A	(19.0)	26.0	29.1	30.7	(34.6)	(39.5)
B	18.4	25.3	28.2	30.3		
C	17.3	24.3	28.1	32.1	32.8	(39.0)
D	17.1	25.6	28.5	33.9	(36.0)	
E	15.0	22.5	26.3	30.9		
F	15.4	23.9	27.3			

Table 3. Mean lengths of whiting year classes in areas A-F, autumn 1961
(figures in brackets based on less than 10 fish)

Year class age group area	1960 I	1959 II	1958 III	1957 IV	1956 V	1955 VI
A	(28.8)	30.6	32.0	(33.7)		
B	27.1	29.8	31.3	36.1	(38.8)	(40.0)
C	23.3	27.0	29.1	32.6		(34.5)
D	24.5	26.6	31.0	36.0		
E	23.0	26.4	28.7	32.3		
F	23.3	27.3	29.8			

Relationship between whiting and the topography and hydrographical conditions.

In the spring there was no apparent correlation between the distribution of whiting and the individual environmental factors of depth, temperature and salinity. It was noted that the temperatures in the spring of 1961 were in general higher than in the spring of 1960, and this may be associated with the higher mean lengths in the spring of 1961 compared with 1960.

For the autumn of 1961 no conclusions can be drawn as the hydrographic charts are not yet available.

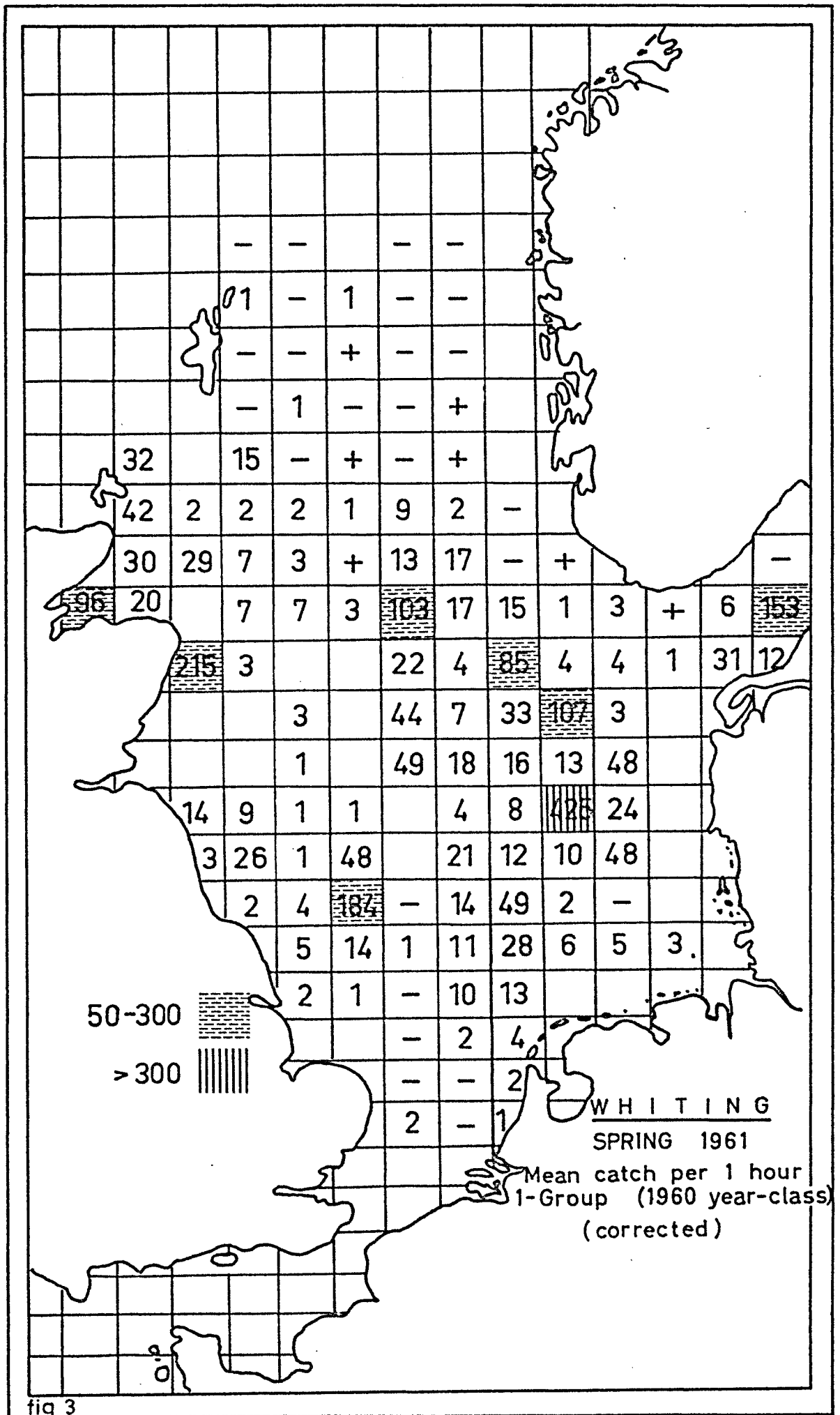


fig 3

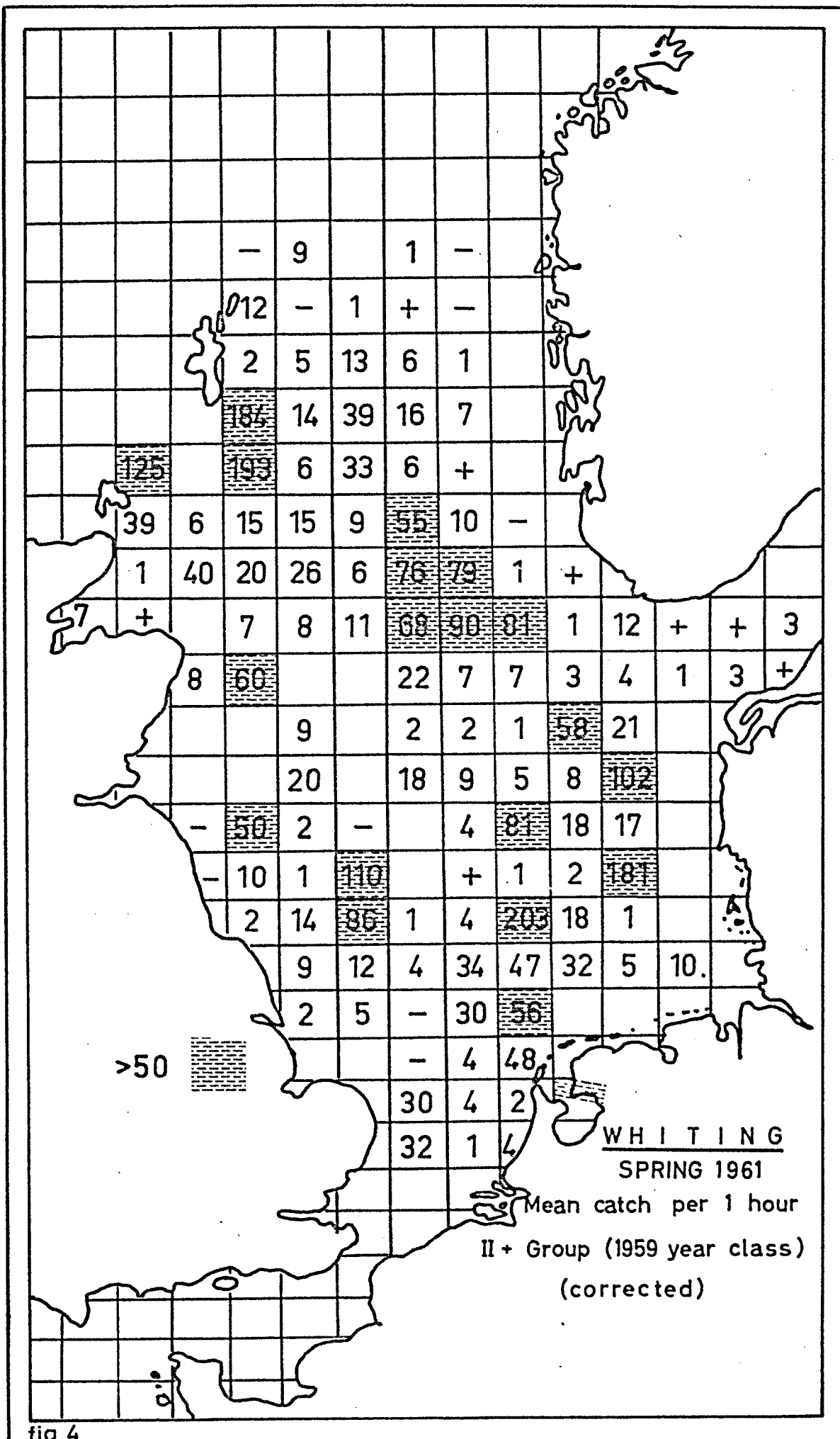


fig 4

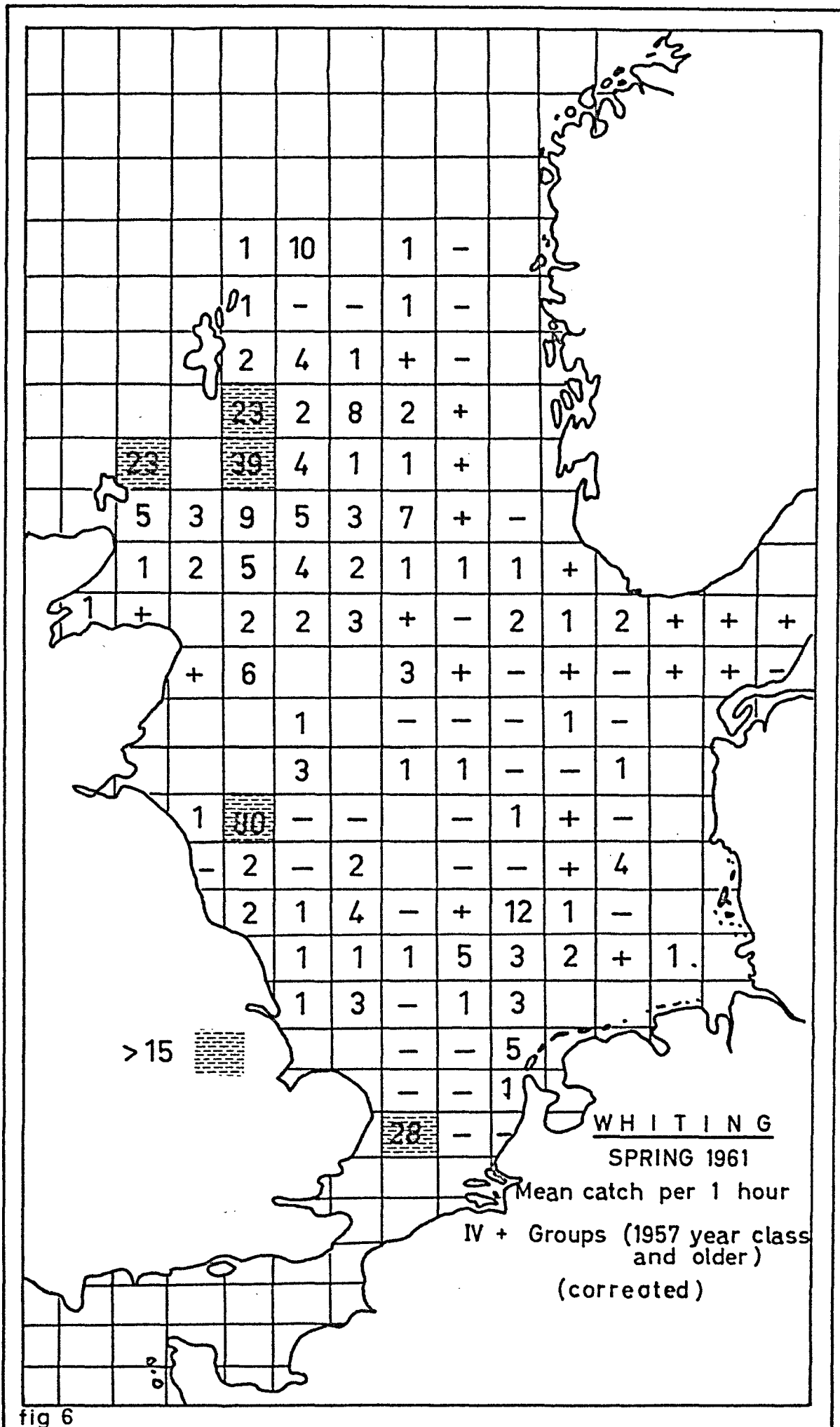
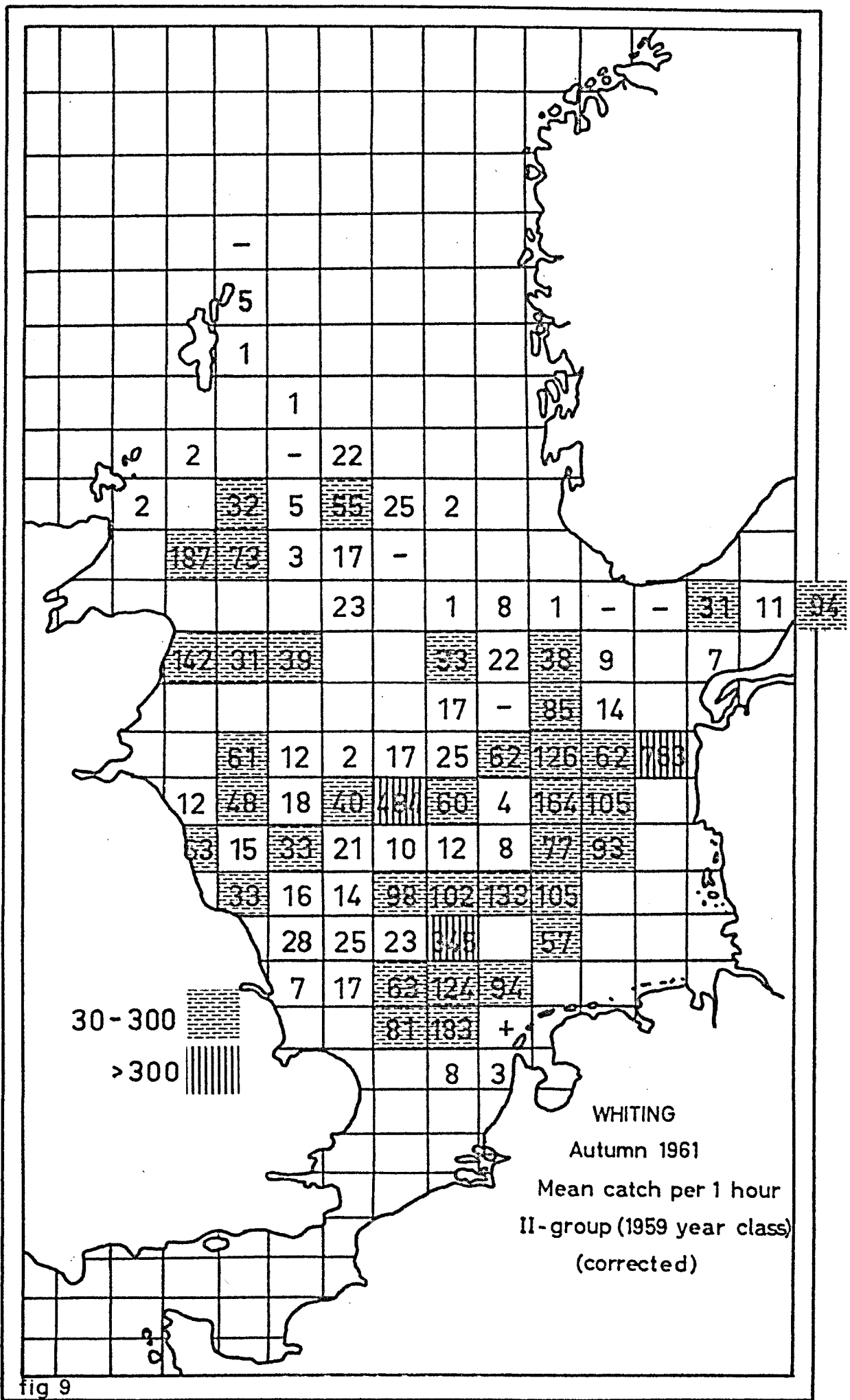
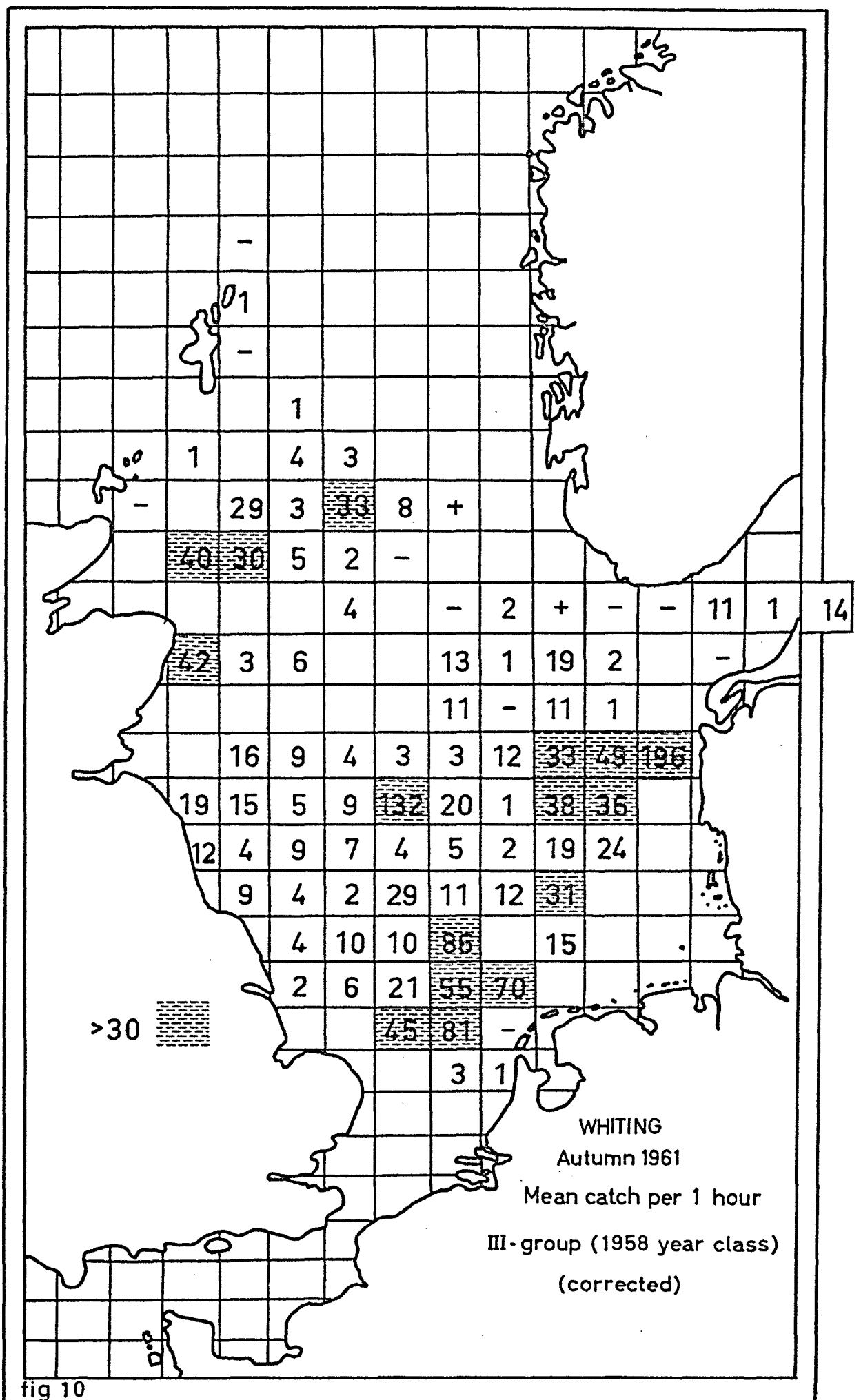
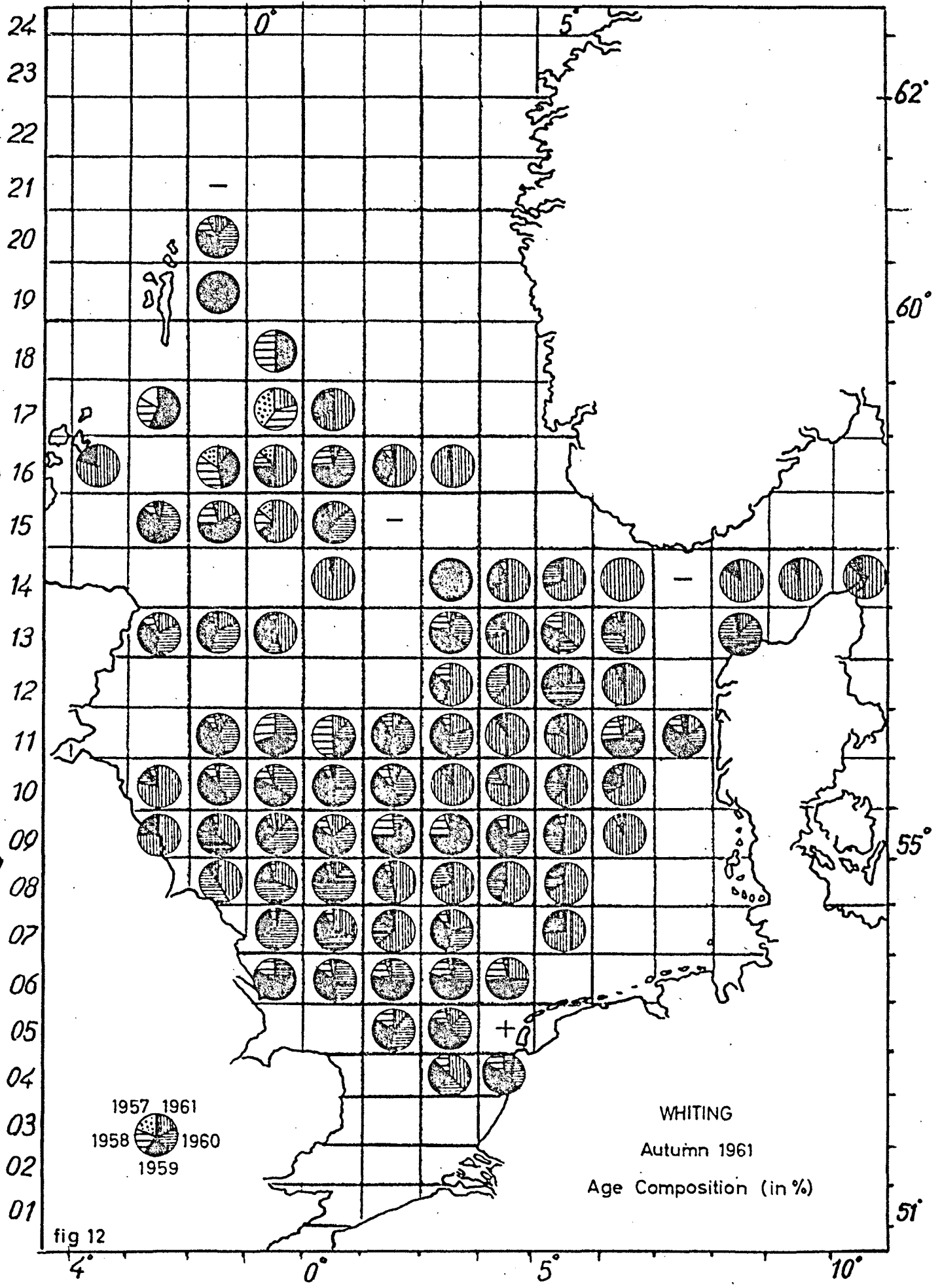


fig 6





A B C D E F G H J K L M N O P



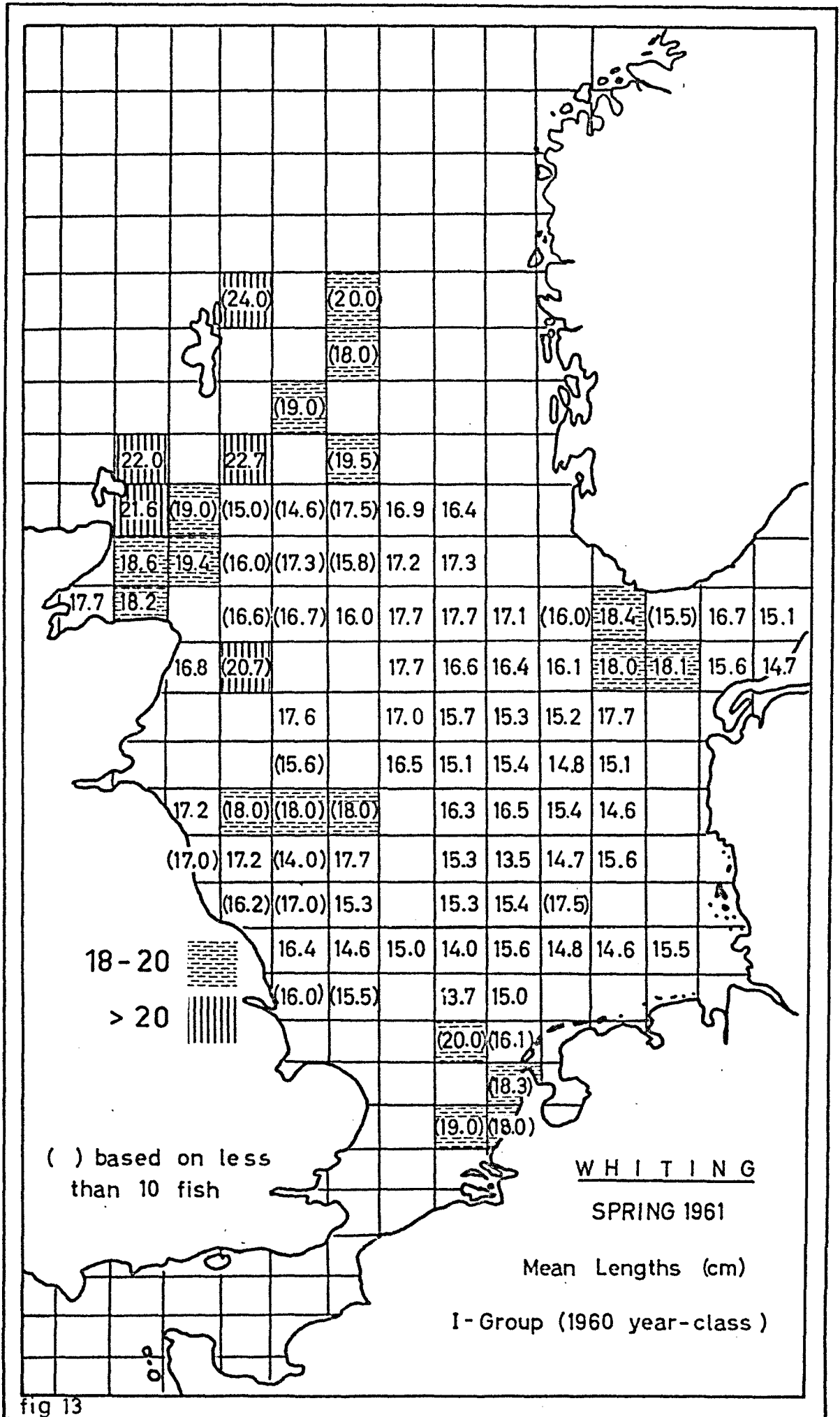


fig 13

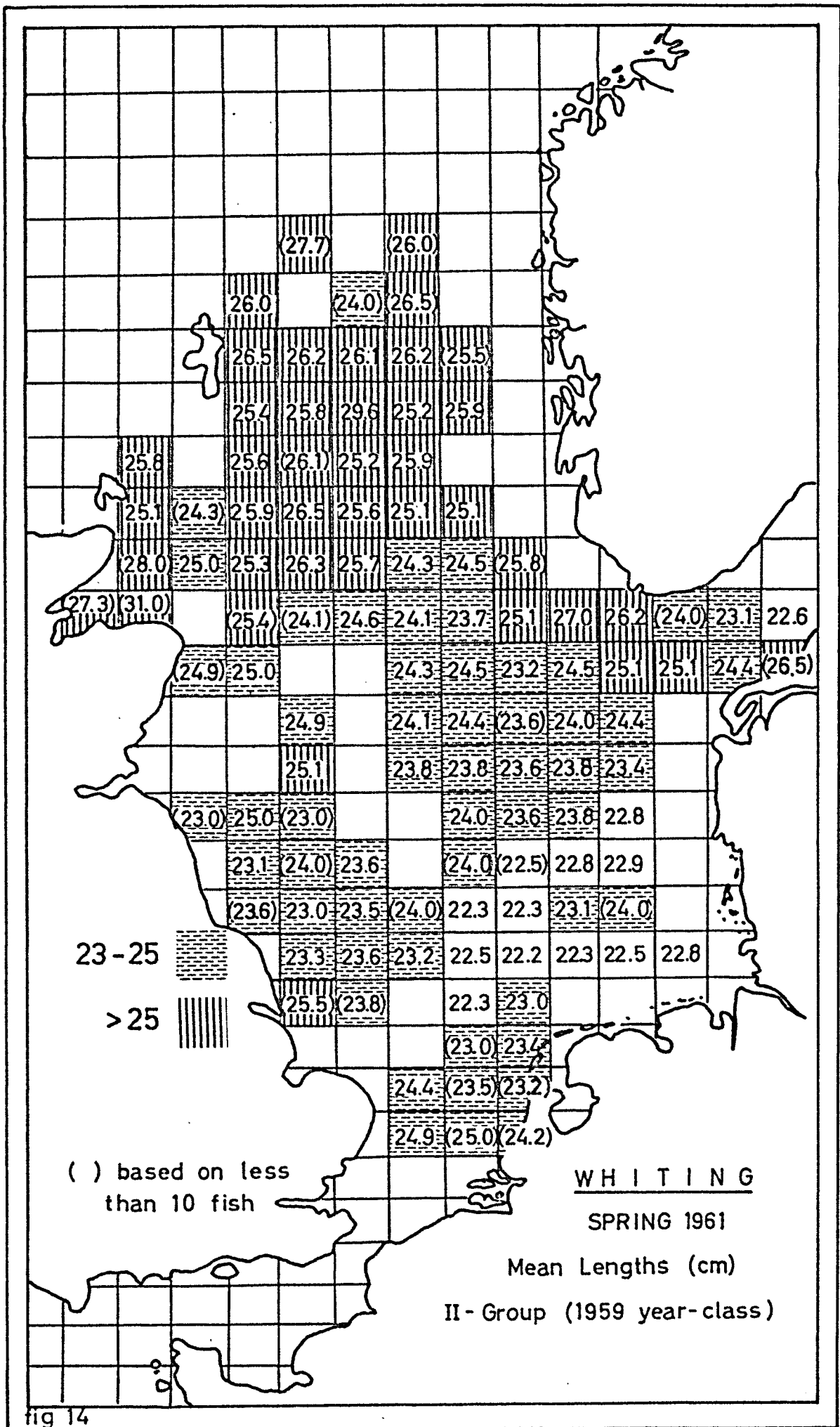


fig 14

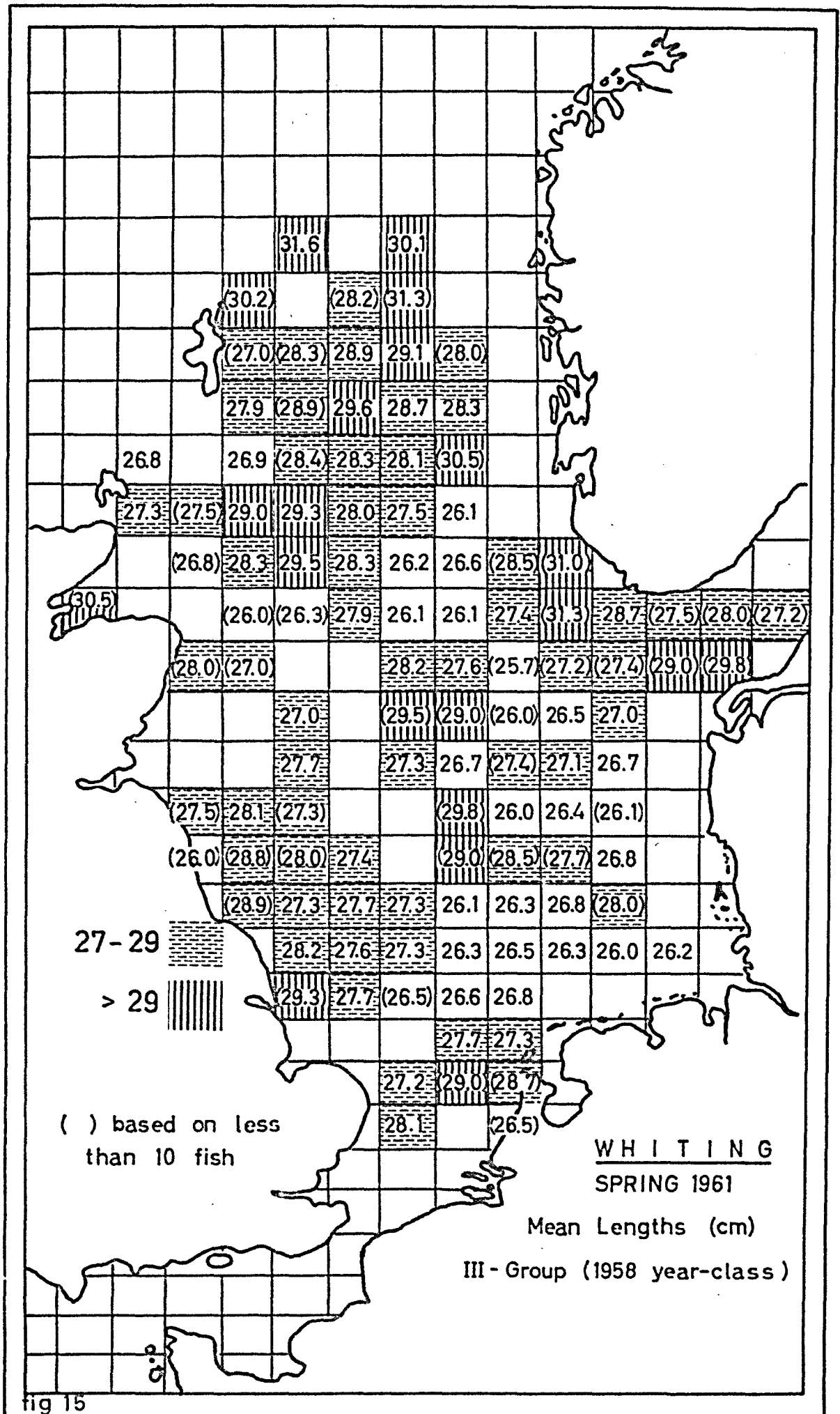


fig 15

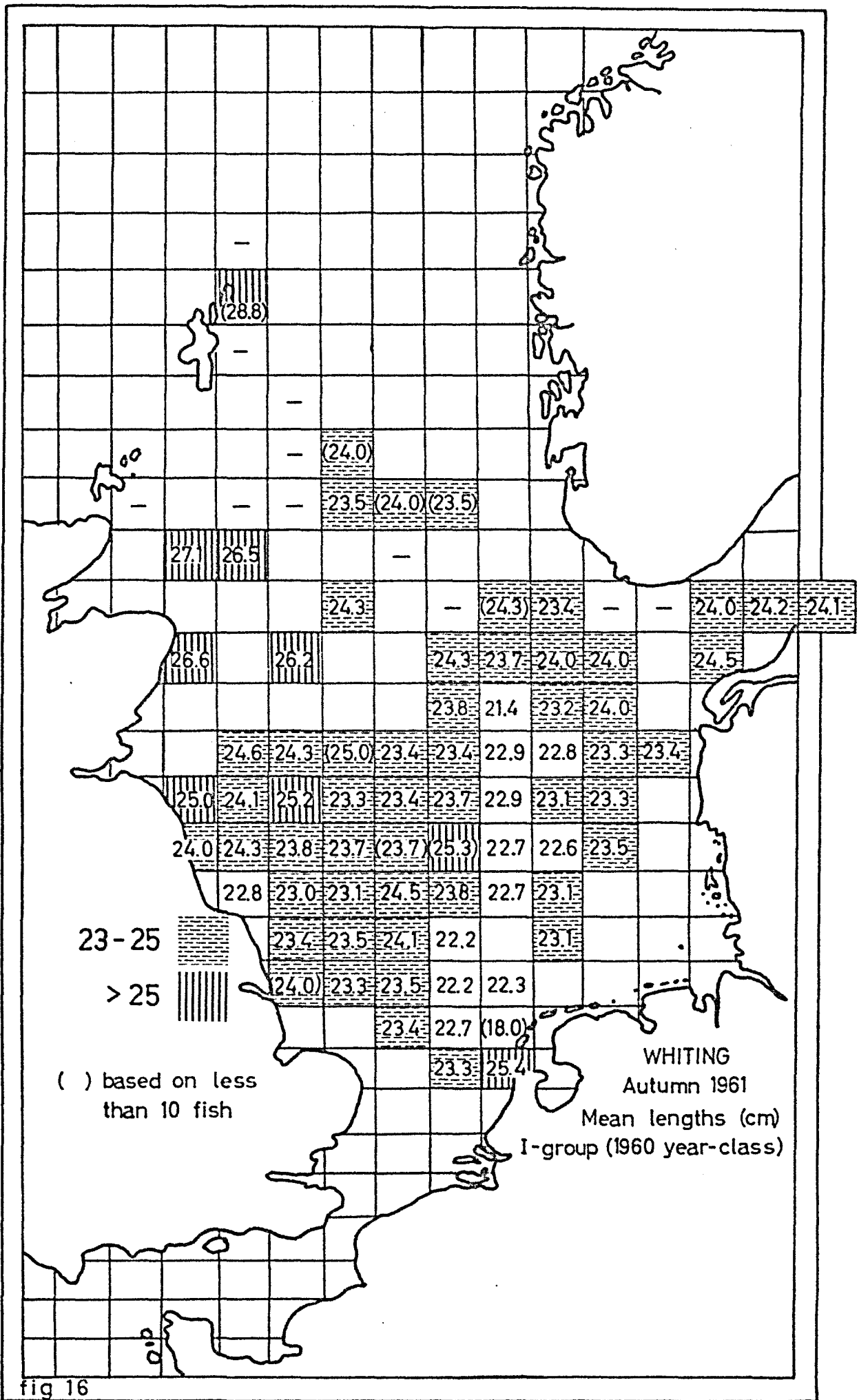


fig 16

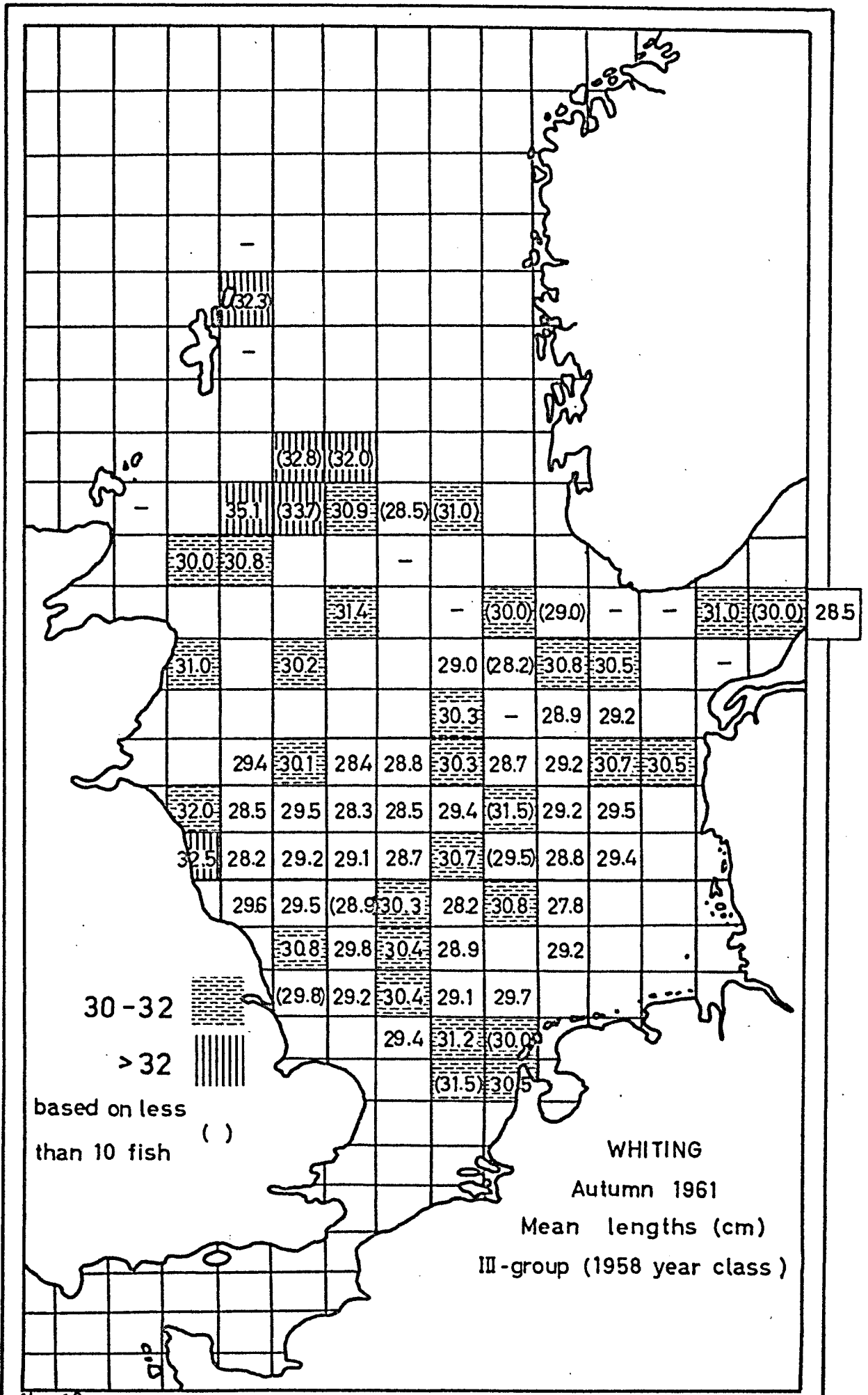


fig 18

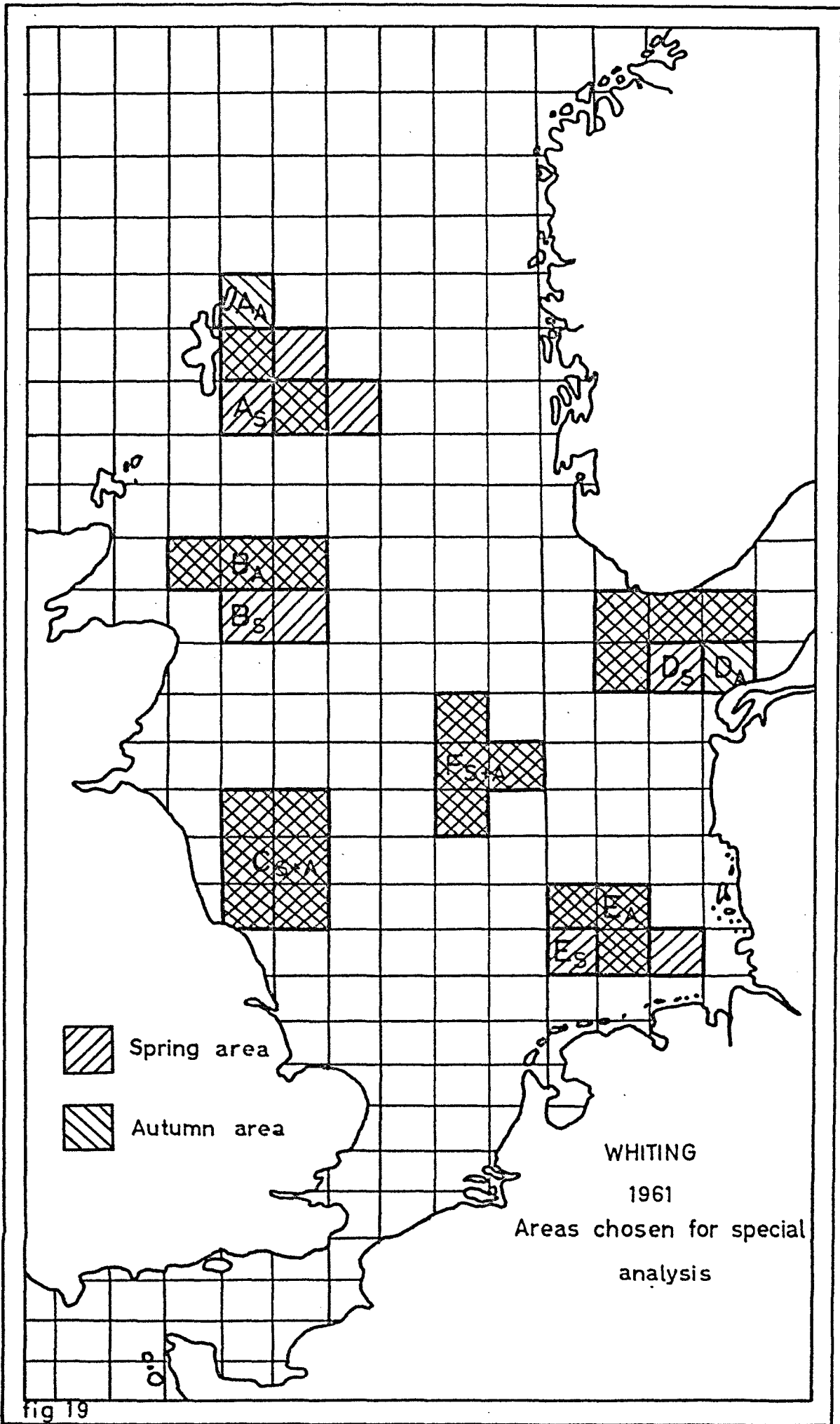


fig 19

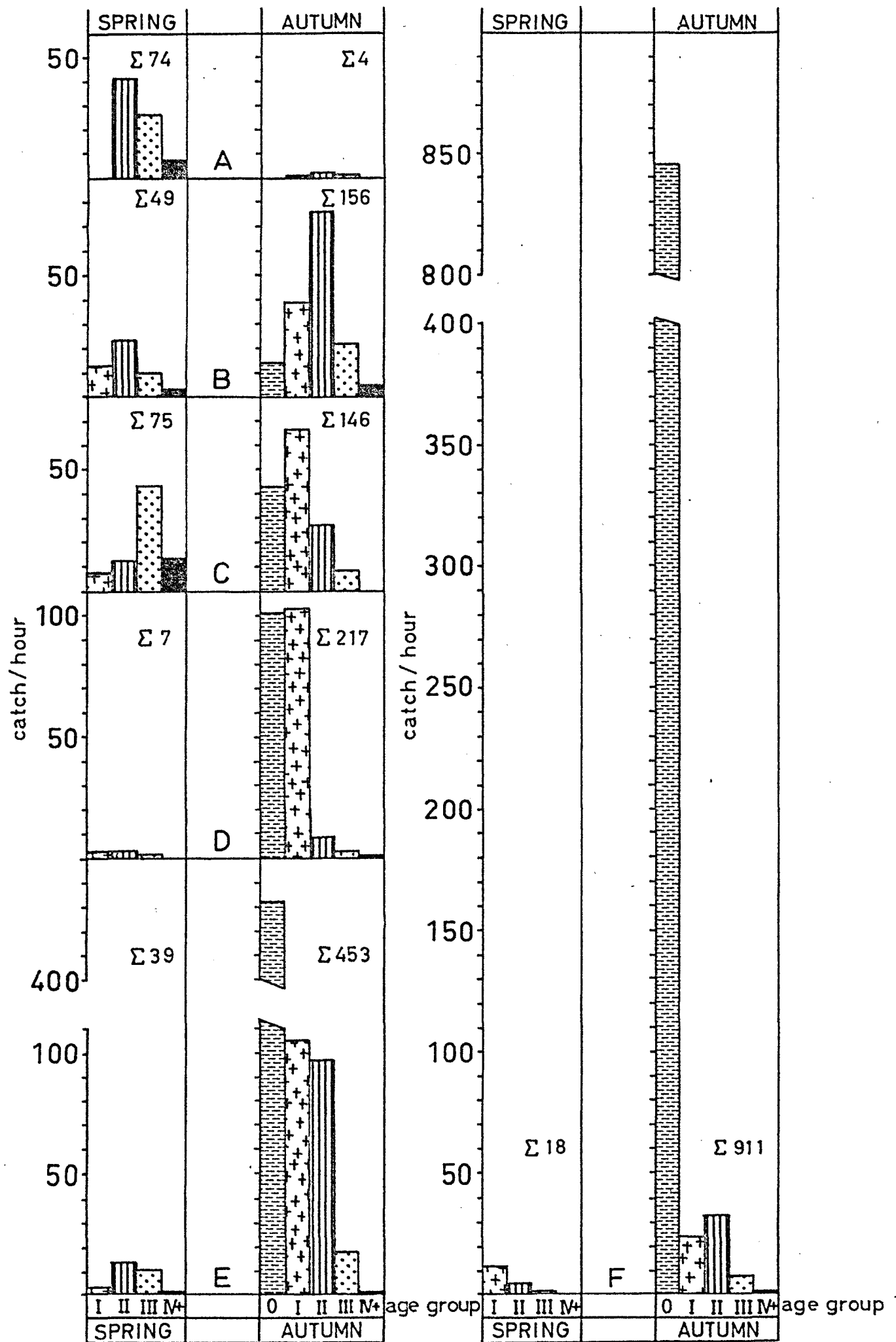


fig 21: Age Compositions in Special Areas - 1961

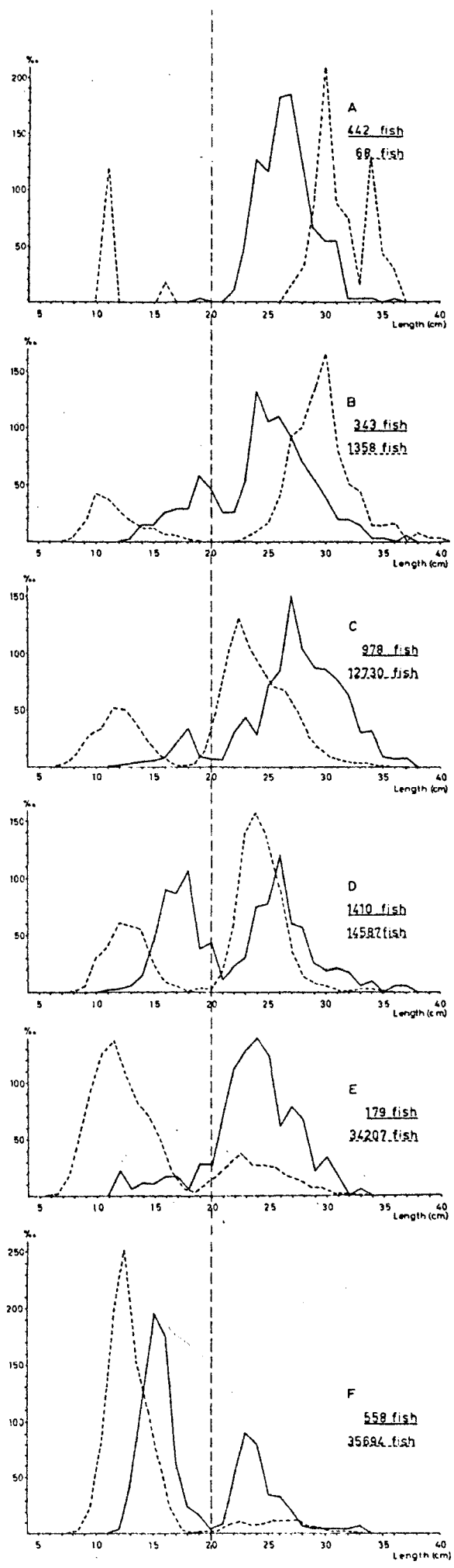


fig 20: Mean length composition of whiting catches in areas A-F in spring 1961 (solid line) and autumn 1961 (broken line)