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Some biometric and biological data on cod from the Newfoundland area

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As in previous years, observations have been made on cod caught by a Spanish commercial trawler, operating off Newfoundland and Labrador. All data were collected in October and the first days of November, 1965.

The last third of the year 1965 seems to have been particularly bad for the fisheries. The ship on which our works were made had caught only some 350 tons of cod (salted) from June to the end of September, and in October the situation was not improved. Most of the time was spent searching fish that never was found in worthwile quantities. This came to an extent that many days it was possible to sample the day's whole catch- less than fourty cod!

Despite all these difficulties in gathering data, the number of codfish studied in divisions 2J and 3Ps (Fig 1) is statistically valid, therefore some results heve been worked from it.

Length frequencies

Figure 2 illustrates the length distribution of cod in division 2J in October. The most abundant length group is that of 51-53 cm (162 o/oo). Age readings have shown that fish of this length group have a mean age of 6,2 years, and fish of the age group 6 are by far the most abundant in our samples. Lengths ranged from 31 to 104 cm.

Length distribution in division 3Ps is given in figure 3. Very poor catches were made in this area, thus the line obtained is not too reliable. Cod were usually very large as indicated by their mean length, 69,9 om but all length groups were scarcely represented in the samples and no length group can be said clearly outstanding. Lenths werw between 33 and 112 cm.

Age frequencies

Age distribution has been studied by stratified sampling of the catches, age-length keys having been applied to fish from divisions 2J and 3Ps. A very short sample (30 cod) was also taken from division 3K, but age length keys have not been applied to it. Figure 4 shows the results obtained from samples of divisions 2J and 3Ps, and figure 5 those of division 3K.As it has been said above, fish of age group 6 (year class 1959) are the most significant of the sample. Asuming from the application of age-length keys that the numbers stimated in the sample are the same that those in the population it can be said 114 thousand fish belong to age group 6, Age groups 4 and 5 are also very large. LIMA DIAS (1965) found that cod aged 5 years were a good part of the Portuguese samples in 1964 from division 2J, that is, fish belonging to the 1959 year class, which presumably are now being fully fished, the 1957 year class being still rather strong (it was the most abundant in 1964). The major quantity of fish belong to year classes 1960 and 1961 which are more than one third of the sample.

In division 3Ps the short number sampled has made it difficult to draw any conclusions. Year class 1959 seams to be also the most important, but all age groups between 4 and 10 are evenly distributed in our samples.

Sex ratio

All cod sampled for ageing purposes have also been sexed. Results are given in table 1. It is remarkable that in all divisions studied this sex ratio is practically the same.

Relationship total length-head length

During all our sampling trips on board commercial trawlers we

have met some troubles to gather samples. Being alone all the time, if the catch was large all men were required to clear the deck as soon as possible, and it was difficult to have somebody to take down data; if, on the other hand, the catch was small, the deck was cleared too quickly, and many times it was hard to get some fish. In both cases it was necessary to hold one of the crewmen on the deck some extra time, what has proved to be quite impopular among them and made it always hard to sample significant numbers of cod.

Our colleague Dr. LOZANO suggested me to employ the same method he used in his work about Spanish and Moroccan tuna (LOZANO, 1958). He was facing the same problem and he decided that the easiest and quickest means to sample tuna were to find the relationship total length. Tuna heads are discarded in the canneries, therefore there was no hurry to sample them, once their relationship to total length was found.

This is exactly the case of our cod trawlers. Cod are headed immediately after arriving on board, and the heads lay on deck quite a few hours some times, so there is no problem in picking a basketfull of them for measuring and taking out otoliths. Of course, there is still the problem of sexing cod, but this can be easily done just standing near one of the spliting tables and recording sex of aplit fish as the men are working. The method of measuring heads is only of application when studies about length and age are to be done.

Heads were measured to the nearest centimeter, as well as total lengths. The head length taken was that from the snout to the edge of the gill operculum (Fig. 6). Data were worked by the mean of the least squares, and the regresion lines obtained are given in figures 7 and 8. They have been drawn from the following equations:

División 2J $y = -1,37604 + 0,26312x$

División 3Ps $y = -1,16414 + 0,27546x$

Where y equals head length and x total length.

Both equations are very similar, and that makes us think that this regresion lines might be applied to cod from all divisions of the Convention area. Perhaps they do not give the exact correlation, but they are accurate enough to let us know which 3 cm length group a specimen belongs to. It is intended to follow this study with data from the rest of the divisions where the Spanish fleet operates,

Summary

Cod of length group 51-53 cm and year class 1959 are the most abundant in division 2J in October. In devision 3Ps, year classes 1960, 1959 and 1958 are the major groups of fish of the samples studied in October and the first days of November, Length group 57-59 seems to be the most abundant.

Sex ratio male/female is very similar in the three divisions studied; 0,86 in division 2J; 0,76 in division 3K and 0,81 in division 3Ps.

Regresion lines of the total length- head length relationship fit the equations

$y = -1,37604 + 0,26312x$ in division 2J.

$y = -1,16414 + 0,27546x$ in division 3Ps.

Table 1. Cod, Div. 2J, 3K and 3Ps. Sex and sex ratio.

	2J		3K		3Ps	
	Nº	%	Nº	%	Nº	%
Males	62	45,5	13	43,3	68	45,1
Females	72	54,5	17	56,7	83	54,9
Total	134	100,0	30	100,0	151	100,0
Ratio	0,86		0,76		0,81	

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LIMA DIAS, M.- 1965. Portuguese Research Report, 1964. I.C.N.A.F. Anual Meeting 1965, Research Document Nº 14.

LOZANO, f.- 1958. Los escómbridos de las aguas españolas y marroquíes y su pesca. Trab. Inst. Esp. Ocean. nº 25.

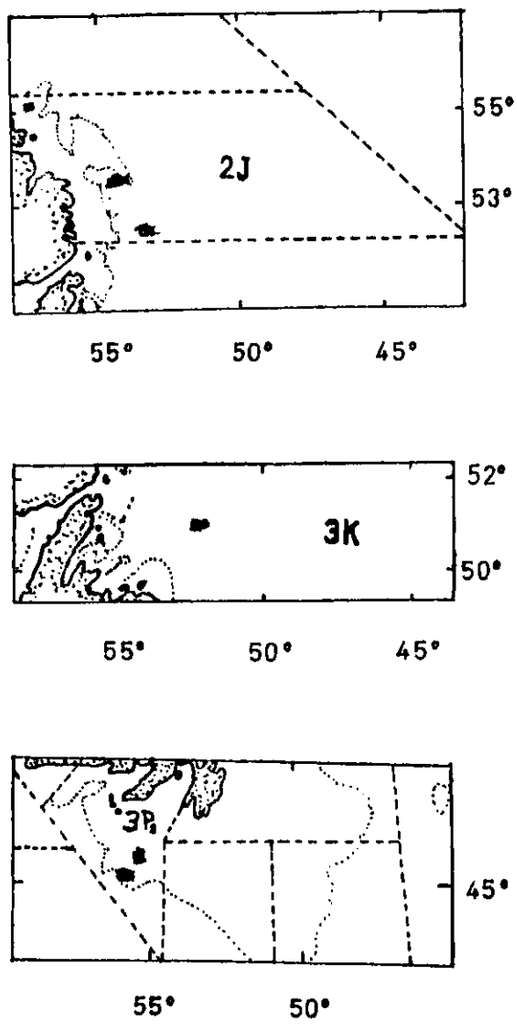

Fig. 1. Areas sampled in October - November, 1965.

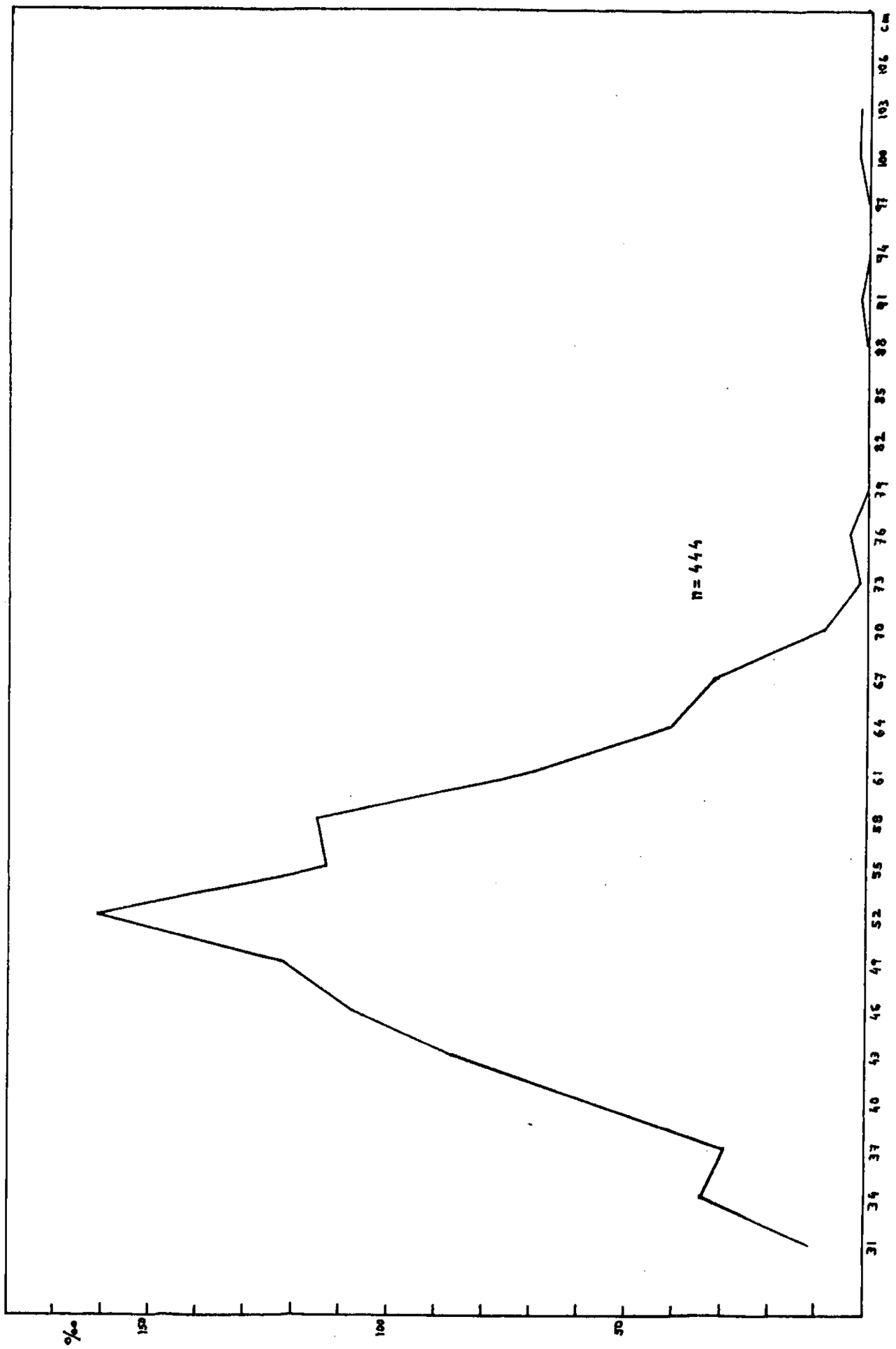

Fig. 2. Cod, Div. 2J. Length composition, October 1965.

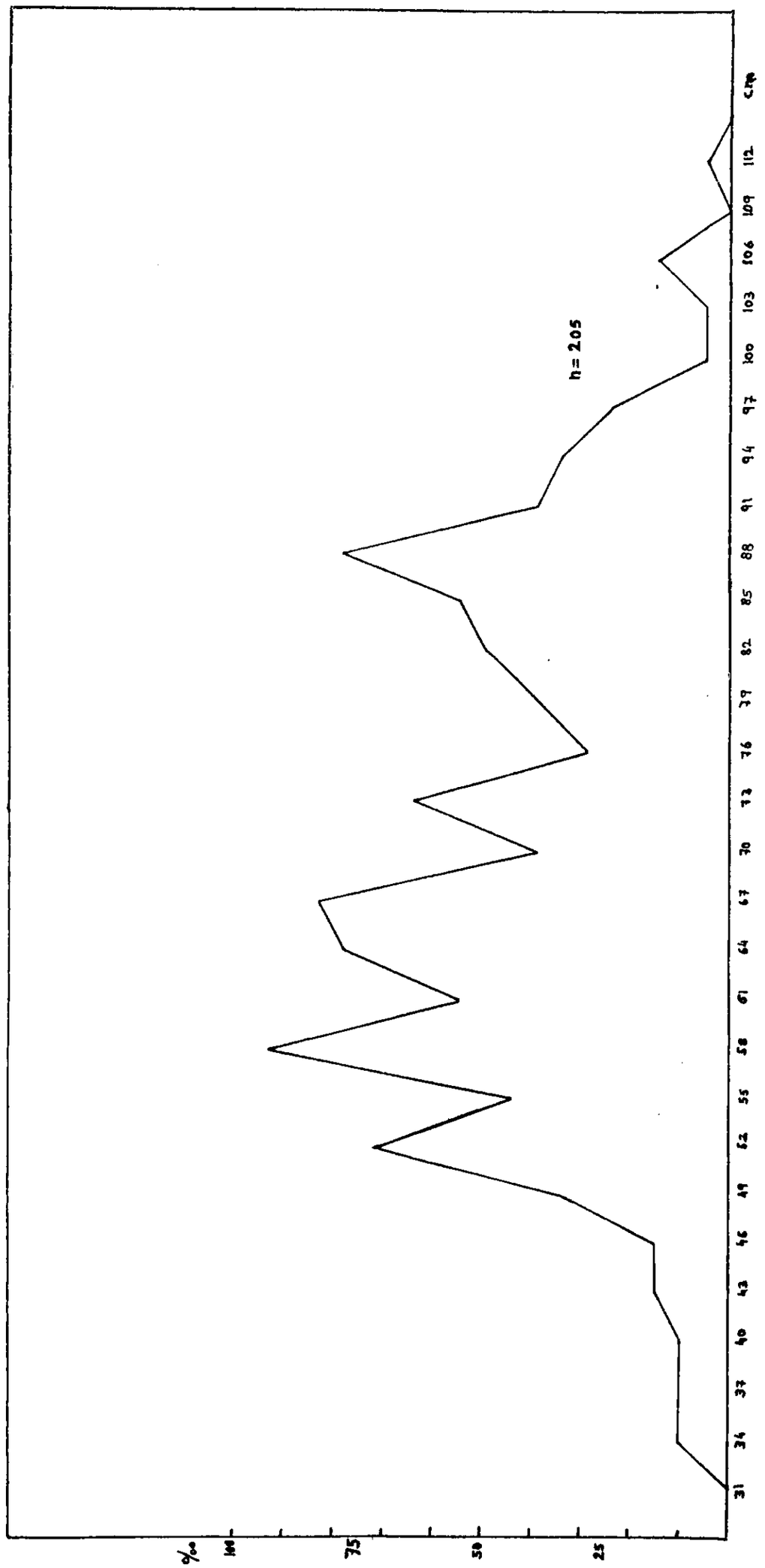

Fig. 3. Cod, Div. 3Ps, length composition, October-November 1965.

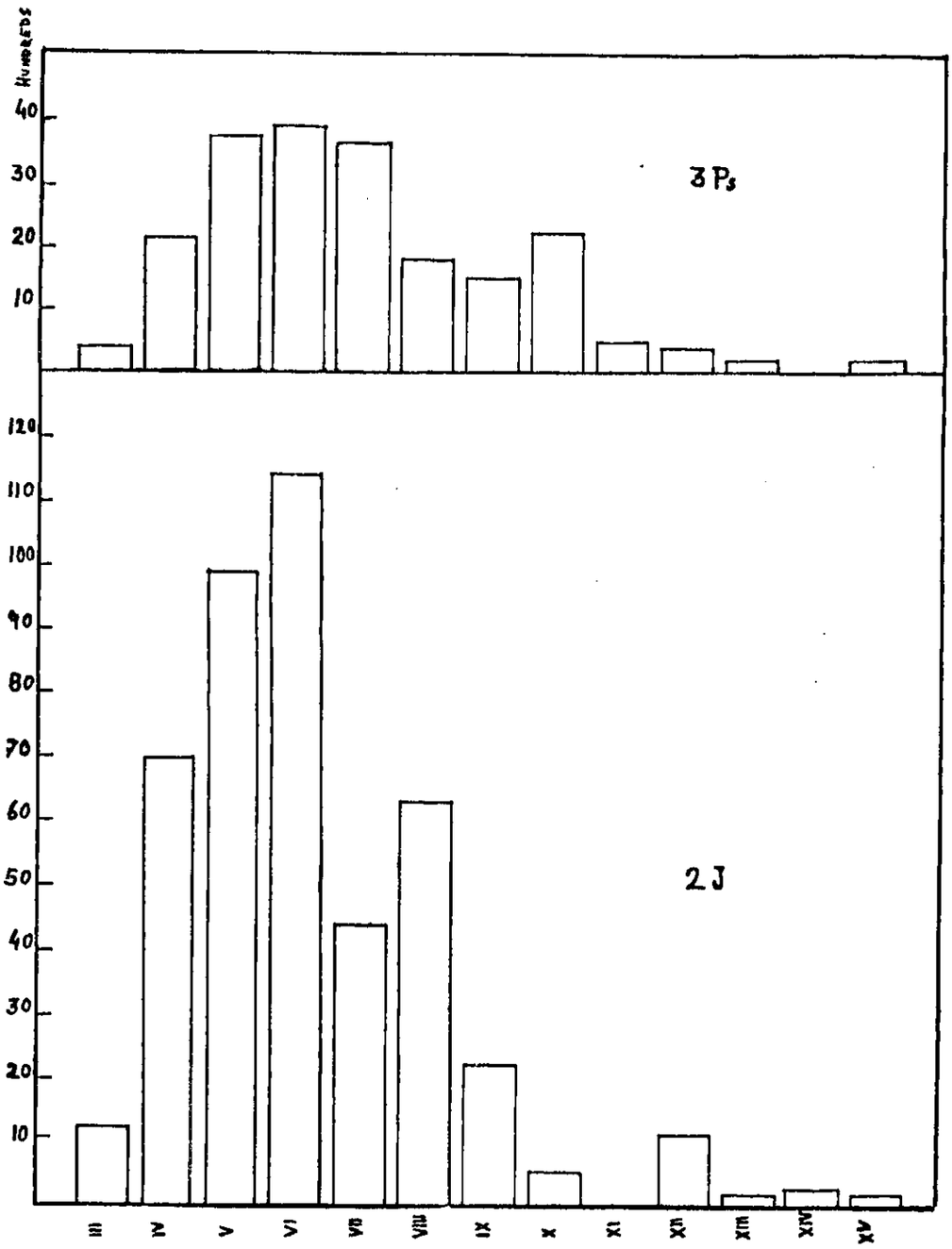

Fig. 4. Cod, Div. 2J and 3Ps. Age composition, October-November, 1965.

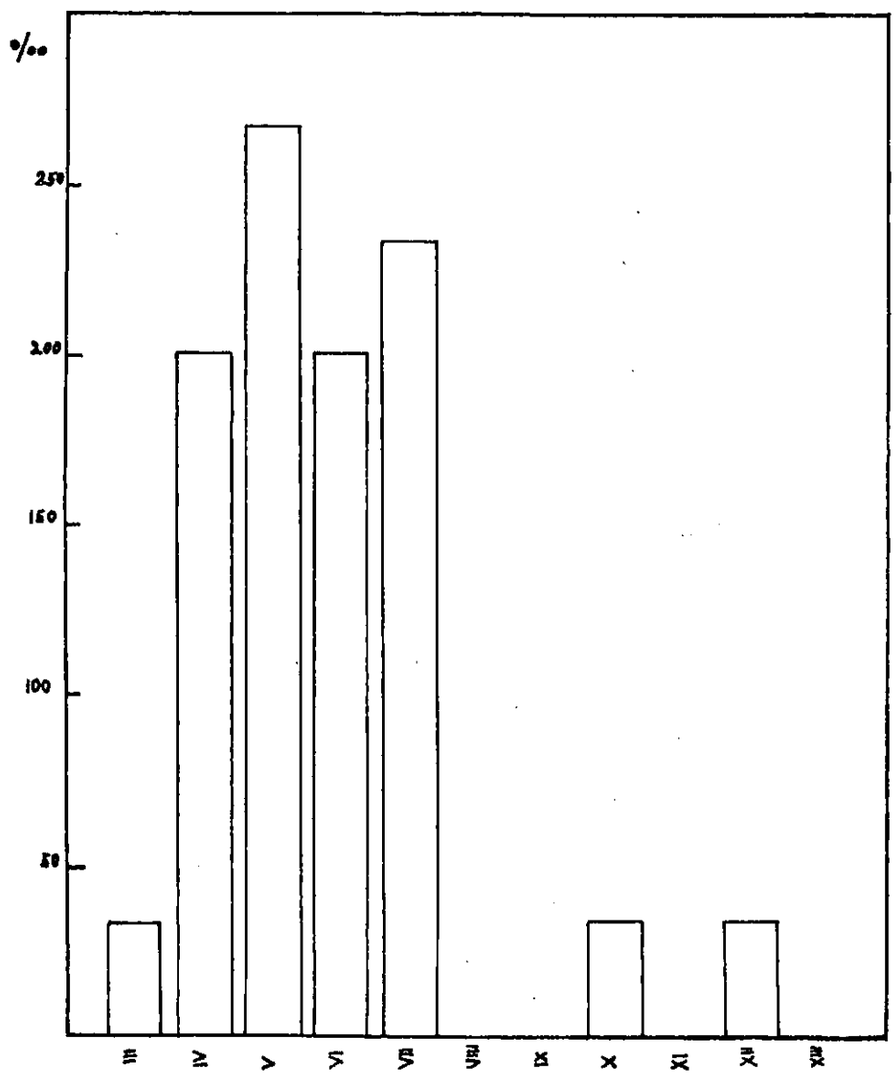

Fig. 5. Cod, Div. 3K. Age composition, October 1965.

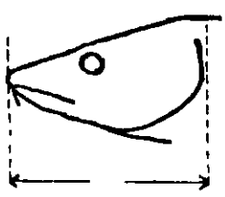

Fig. 6. Distance measured for head length.

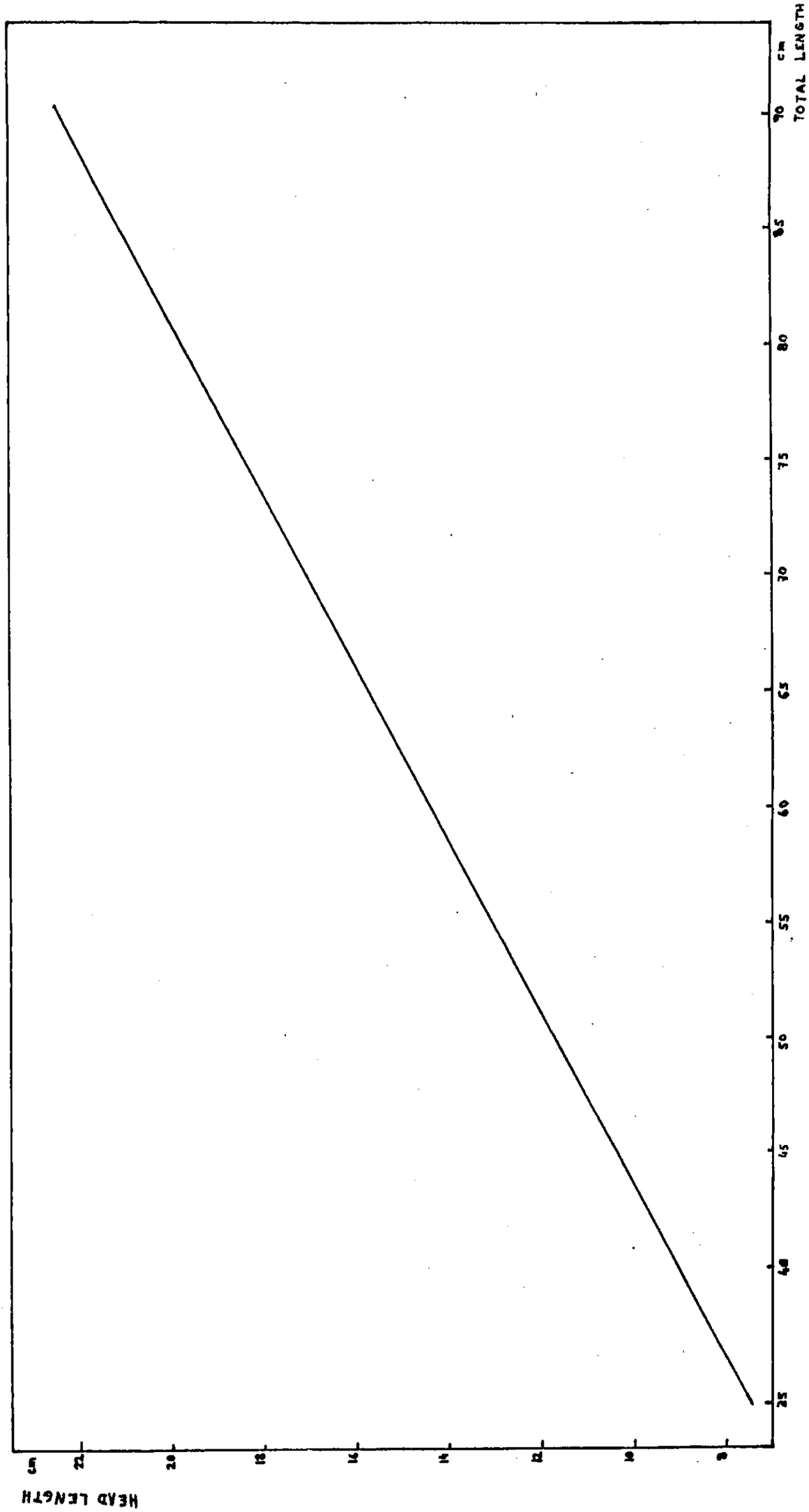

Fig. 7. Cod, Div. 2J. Total length - head length regresion line.

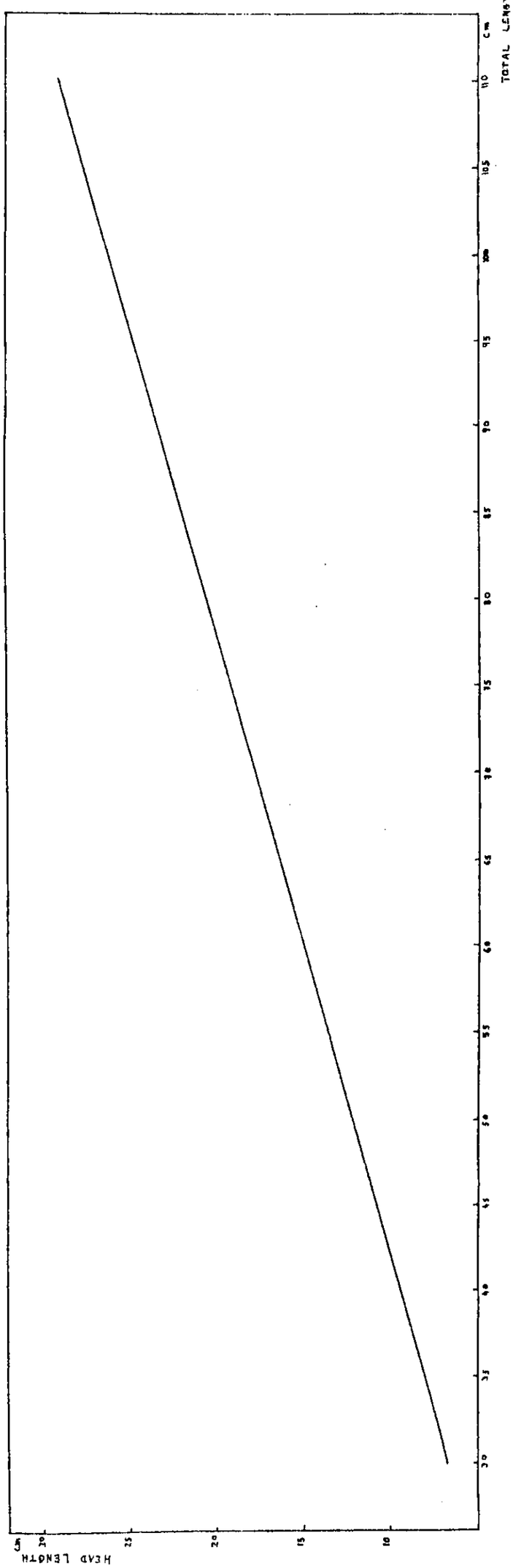

Fig. 8. Cod, Div. 3Ps. Total length-head length regresion line.