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Polish observations on the course of Georges Bank herring spawning
in relation to catch per tow, 1972-1974

by

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INTRODUCTION

For the purpose of herring stock assessment in the ICNAF Area, there is an increasing need to conduct as many observations on changes of the life history of the stock as possible.

In this paper Polish data on maturity stages of George's Bank herring in September and October 1972 - 1974 together with catch-per-tow data from a B-29 freezing-trawler were compared to assess their validity in the determination of the outset of spawning.

METHOD USED

The daily data on the percentage of herring of maturity stages VI and VII /spawning and recently spent/ in September - October for each year separately and catch-per-tow of the B-29 freezing-trawler, were plotted against time in days./Figs. 1, 2 and 3/. The procedure was based on the assumption of positive correlation between these values. The date on which catch-per-tow increased significantly and was maintained for at least a few days was chosen as the beginning of the mass herring spawning.

The catch-per-tow data were derived from the same trawler on board which the biological data were collected.

DISCUSSION OF THE RESULTS

Examination of data on stages of maturity of herring derived from the main spawning grounds of George's Bank in the months preceding September 1972 - 1974 showed a gradual increase of this maturity to the moment when 80-90% of the fish reached stage V at the end of August.

From that time samples with a majority of fish in stages VI and VII began to occur with increasing frequency.

In 1972, the beginning of the mass herring spawning is easily visible from Fig.1 in the period between September 24th and 26th when catch-per-tow and number of fish in stages VI and VII increased rapidly as compared with previous days. The relatively high fishing efficiency was maintained for a couple of days until October 8th. The spawning was then interrupted by stormy weather which dispersed the schools of spawning herring.

In 1973 almost the same pattern of spawning was observed./Fig.2/. The distinct increase in the number of fish with gonads in stage VI and VII /up to 60%/ which occurred on September 24th overlapped the increase in catch-per-tow. The period of effective fishing extended to approximately October 16th.

In both years in question, the next period characterized by lower catch-per-tow results was of fairly short duration /several days/ and was again followed by a period of better fishing.

The outset and course of spawning in 1974 differed. The great share of the spawning fish was found as early as September 19th, and one day later a short -term increase in catch-per-tow was observed, lasting until September 27th. Most likely the second day of October of that year can be regarded as the outset of mass spawning of the Georges Bank herring. After that date high, although unstable catch-per-tow values were noted /Fig.3/.

The changes observed in the outset of spawning, as well as its variable intensity in both months discussed, resulted in a drop in the share of catches in September and a rise in October./Table 1/.

An interesting feature was the opposite trend in percentage of fish with fully developed gonads than could be expected.

Table 1

The share of spawning herring and catches
in September-October, 1972-1974

Year	S e p t e m b e r		O c t o b e r	
	maturity ^{x/} stages VI + VII	catches ^{xx/}	maturity stages VI + VII	catches
	%	%	%	%
1972	27	35	99	32
1973	32	34	85	42
1974	37	19	75	46

x/ percentage of fish with gonads in stages VI and VII

xx/ Percentage of catches in relation to total landings during the year

Undoubtedly one of the main reasons for the shiftings noted was an increase of temperature of water masses in George's Bank during the spawning seasons concerned.

Georges Bank 1972

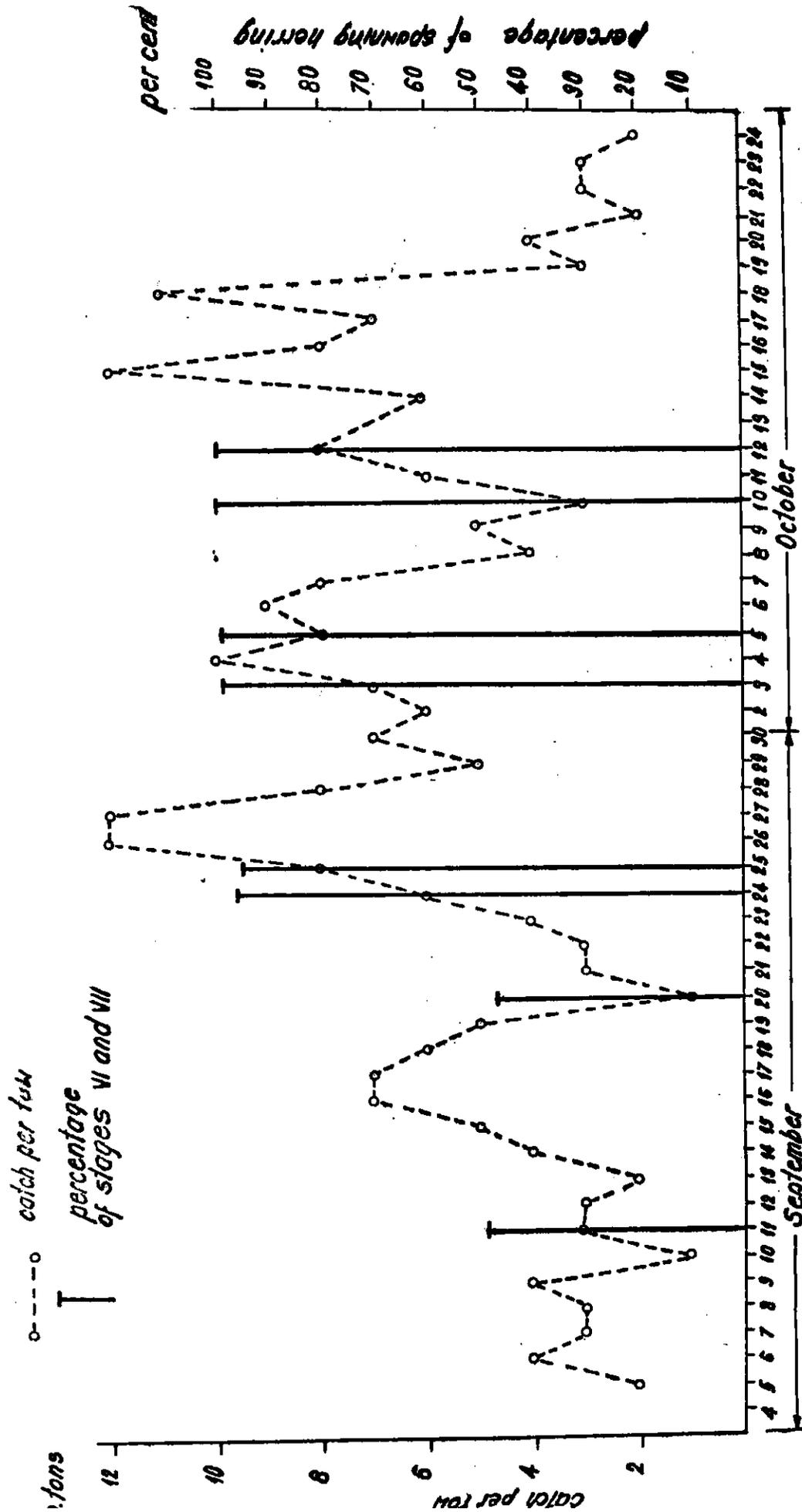


Fig. 1. Relation between catch per tow of chosen B-29 freezing trawler and percentage of spanning herring (stage vi+viij) in samples

Georges Bank 1973

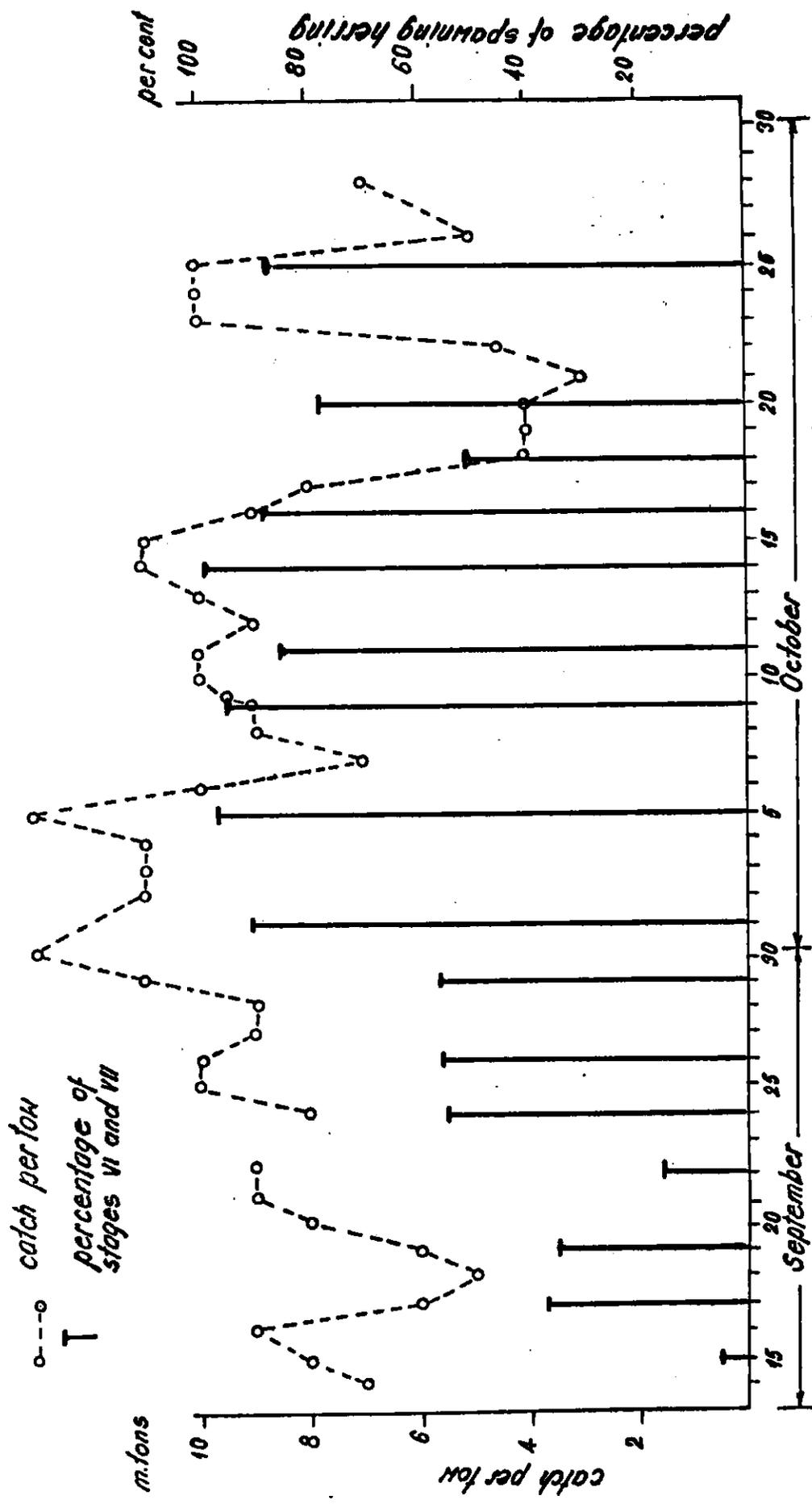


Fig. 2. Relation between catch per tow of chosen B-29 freezing trawler and percentage of spawning herring (stages VI + VII) in samples.

Georges Bank 1974



 catch per ton
 percentage of
 stages VI and VIII

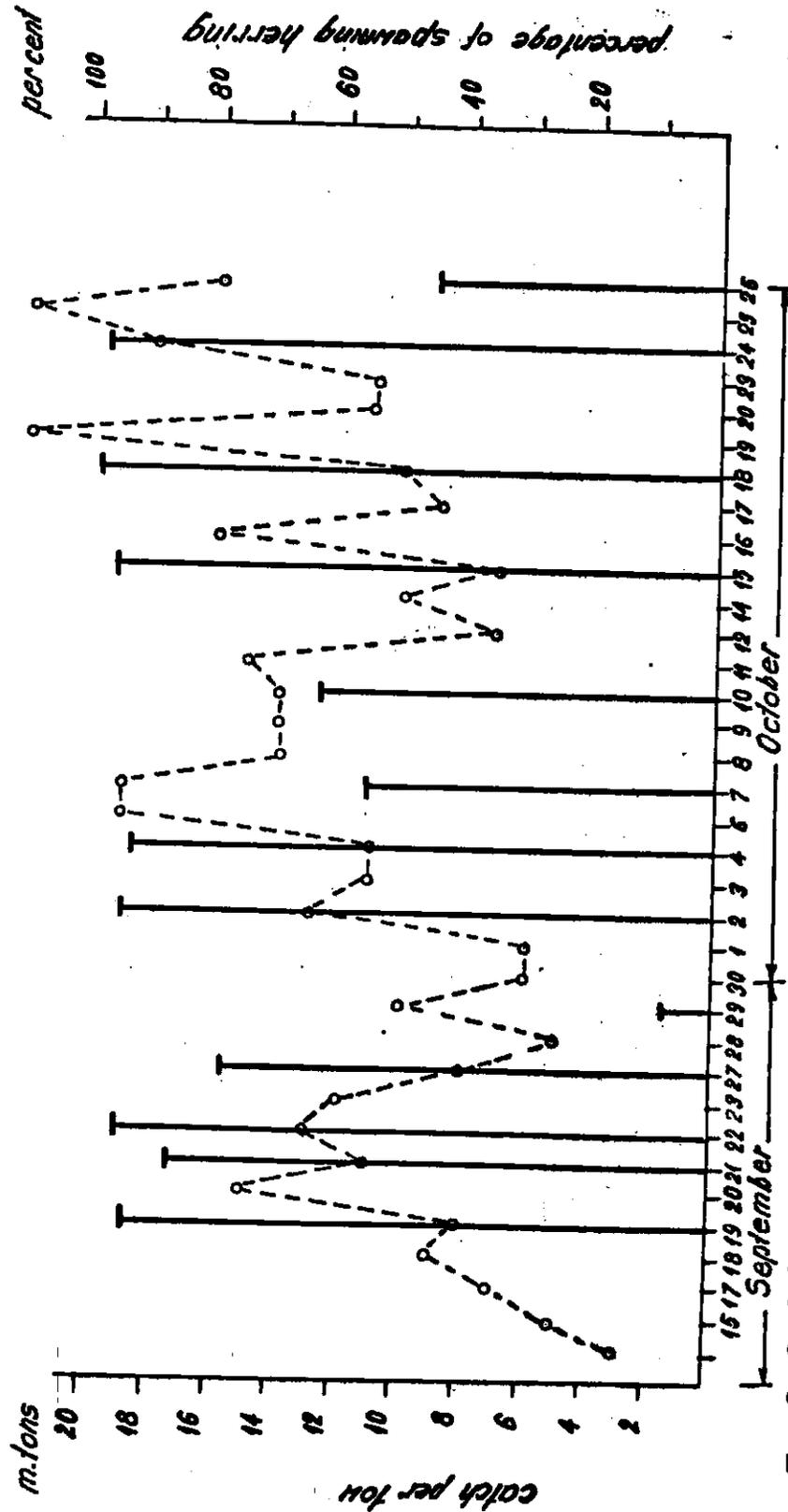


Fig. 3. Relation between catch per ton of chosen B-29 freezing trawler and percentage of spawning herring (stages VI+VIII) in samples