Wadge Bank Trawl Fishery Studies

PART I

The effect of the 1928 to 1935 commercial trawling on the demersal stock

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INTRODUCTION

THE demersal fish stock of Wadge Bank is one of the important fish resources for both Ceylon and India. Sivalingam and Medcof (1957) have given an account of its history, general features and relative productivity. According to records the total fishing effort on the bank had been fluctuating and very recently the number of boats operating on the bank has suddenly increased, and there is a possibility that still more will begin operating on the bank in the near future (Mendis, 1965).

The increased fishing effort with the possibility of still further increase calls for proper management practices by those concerned, in order to obtain the maximum sustained yield from the demersal stock. For this purpose a detailed study of the past performance of the fishery is essential. With this in view all records of commercial operations up to 1960 are being analysed by the present author and are to be published in a series. This is the first paper in the series and gives a detailed analysis of the first commercial trawling operations from 1928 to 1935. Since there had been a major break of about 10 years between this and the present fishery this data is being analysed seperately. The author was associated with the fishery on the Wadge Bank from 1953 till 1961 during which time the data were collected.

FISH LANDING RECORDS

A private company, " The Ceylon Fisheries Ltd " which during certain months fished with its trawlers the " Bulbul " from 1928 to 1930 and " Tongkol " from 1928 to 1929 on the Pedro Bank (Sivalingam 1964), operated the same trawlers during the rest of the year on the Wadge Bank. This company maintained careful records of the fish landings and movements of the trawlers the details of which have been given in an earlier paper (Sivalingam 1964). The data for the following analysis were obtained from this original record. This record does not give details of daily operations, but gives a summary for each trip of each trawler. One major disadvantage in these records is that some commercially important distinct varieties (Sivalingam and Medcof (1957) like *Arius thalassinus* (Bleeker), *Plectorhynchus pictus* (Tanaka) and *Lutianus rivulatus* (Cuvier) have not been recorded separately, while others of minor commercial importance for this fishery like " Geelawa " (*Sphyraena* sp.) have been recorded as separate categories. As a result it is not possible to determine the effect of trawling, individually, on all commercially important species.

TRAWLING OPERATIONS

The company started operating its trawlers on the Wadge Bank in May, 1928 and continued till August, 1935 when it went into liquidation. Of the two trawlers, specifications of which have been given earlier (Sivalingam and Medcof 1957), the " Tongkol " operated till September 1929 while the " Bulbul " continued to operate till the end. From the information available it appears that these were the only two trawlers that operated on the Wadge Bank commercially, during the period. During the same period the trawlers also operated on the

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Pedro Bank, but made fewer trips (Sivalingam 1964). The trawlers operated more or less throughout the year including the southwest monsoon months. It has already been shown (Sivalingam 1964) that for purposes of this analysis both " Tangkol " and " Bulbul " were of equal efficiency. The catch per unit of fishing effort, in this case " catch per day's trawling " is used as an indicator of the relative population strength on the bank. During certain fishing trips while out of the harbour the trawlers were engaged in other work like light house relief work, salvage work etc. in addition to fishing. The data from these trips have been excluded from the analysis, since the time spent on fishing alone could not be estimated separately. Summary of the data for all the fishing trips is given in Table I.

SEASONAL WITHIN THE YEAR VARIATION

Variation in the total catch per day's trawling for each month is given in figure 1. It will be observed that throughout the period the catch during the southwest monsoon months, May to October was conspicuously higher than that during the northeast monsoon months November to April as was observed earlier (Sivalingam and Medcof 1957). This variation is due to mainly the varieties called " Paraw " (Carangids) and " Sharks " (Elasmobranchs) being eaught in large quantities during the southwest monsoon months and in relatively inconspicuous quantities during the rest of the year (fig. 2). Two other varieties namely " Tambua " (Lutianids) (fig. 3) and " Mixed " (fig. 4) do show an increase during the same season, but their catches during the rest of the year are quite appreciable. The other varieties " Laweya " (Epinephelids) (fig. 3) and " Meevatiya " (Lethrinids) (fig. 4) do not exhibit any consistent patterns. For this analysis " Paraw " and " Sharks " are classified as migrant varieties and others resident varieties.

During February, March and April when catches are lower than the rest of the year on the Wadge Bank, the company appears to have tried fishing on the Pedro Bank in 1929 and 1930. But operations on the Wadge Bank during subsequent years during February to April show that though the catch on the Wadge Bank during February to April is lower than its catches during the rest of the year, the catch during these months is more or less the same as that on the Pedro Bank for the same period of the year (Table II). Wadge Bank being closer to the port (Colombo) subsequent operations during February to April were on the Wadge Bank.

YEAR TO YEAR VARIATION

The variation in the catch per unit of fishing effort from year to year is an important indicator of the state of the fish stock on the Bank. These changes could be as a result of either natural causes or changes in fishing effort or both. If the changes are adverse it will be necessary to determine to what extent fishing effort has been responsible for the changes and take counter measures for proper management practice.

Catch per fishing day for the years 1928 to 1935 is given in figure 5. The figure shows a steady increase in the catch throughout the period and in 1932 fishing conditions appear to have been exceptionally good. The increase in catch rate over the years was due to either the gradual increase in the knowledge of the fishing characteristics of the Bank to the skippers of the trawlers or increase in knowledge coupled with an increase in the strength of the fish stock. The increase in the catch rate was recorded with a gradual increase in the total fishing effort up to 1933. This increase in fishing effort, therefore, appears to have had no adverse effect on the stock.

An analysis of the catch of the different varieties will be necessary to determine the effect of fishing on them individually. Figures 6 and 7 give the year to year variations in catch per unit effort for the more important varieties. For the varieties " Tambua " and " Meevatiya " it will be observed that there has been a fluctuation in the catch rate without any definite pattern. On the other hand " Laweya " has been on the increase very gradually. The varieties recorded as " Mixed " has had a conspicuous increase since 1932. As to what particular species contributed to this increase is not known.

Due to changes in both fishing intensity and catch per day there had been changes in the total annual landings. The maximum was about 1.33 million pounds in 1932. Though the total catch per day's fishing increased the company operating the trawlers appear to have had marketing problems. The price per pound was on the decline from the very first year (Table I) and as in the case of the Pedro Bank (Sivalingam 1964) the increase in catch rate has not compensated for the decline in prices, as a result of which proceeds per day out of port declined (Table I).

CONCLUSION

It may be finally summarised that the operation of the two trawlers "Bulbul" and "Tongkol" on the Wadge Bank between 1928 and 1935 did not have any adverse effect on the demersal stock on the Wadge Bank. If at all it did have an effect, it was for the better and the catch per day's fishing was on the increase throughout the period. But there appears to have been a change in the species composition of the catch. The catch rate of some of the varieties did not change appreciably while that of others increased gradually or abruptly.

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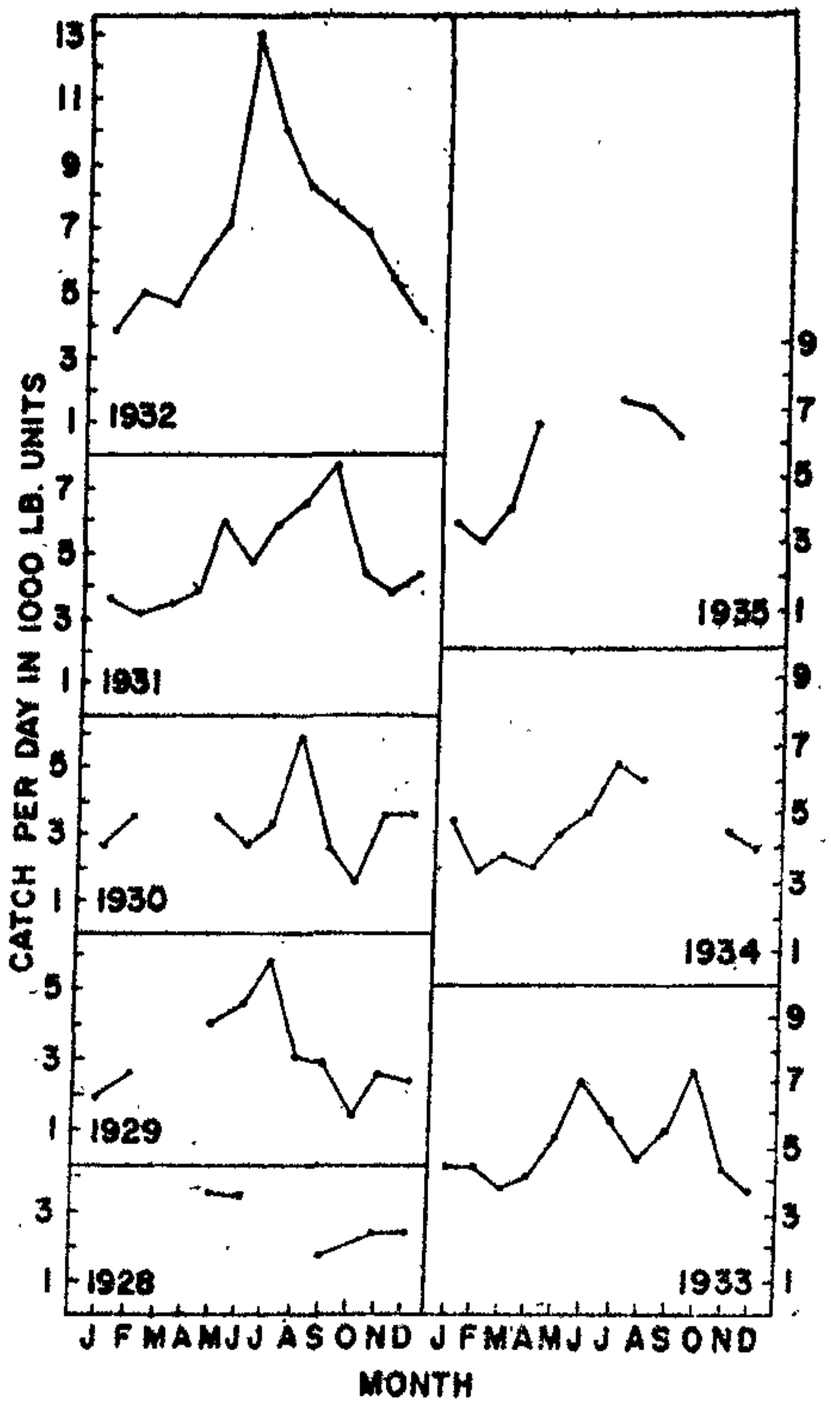
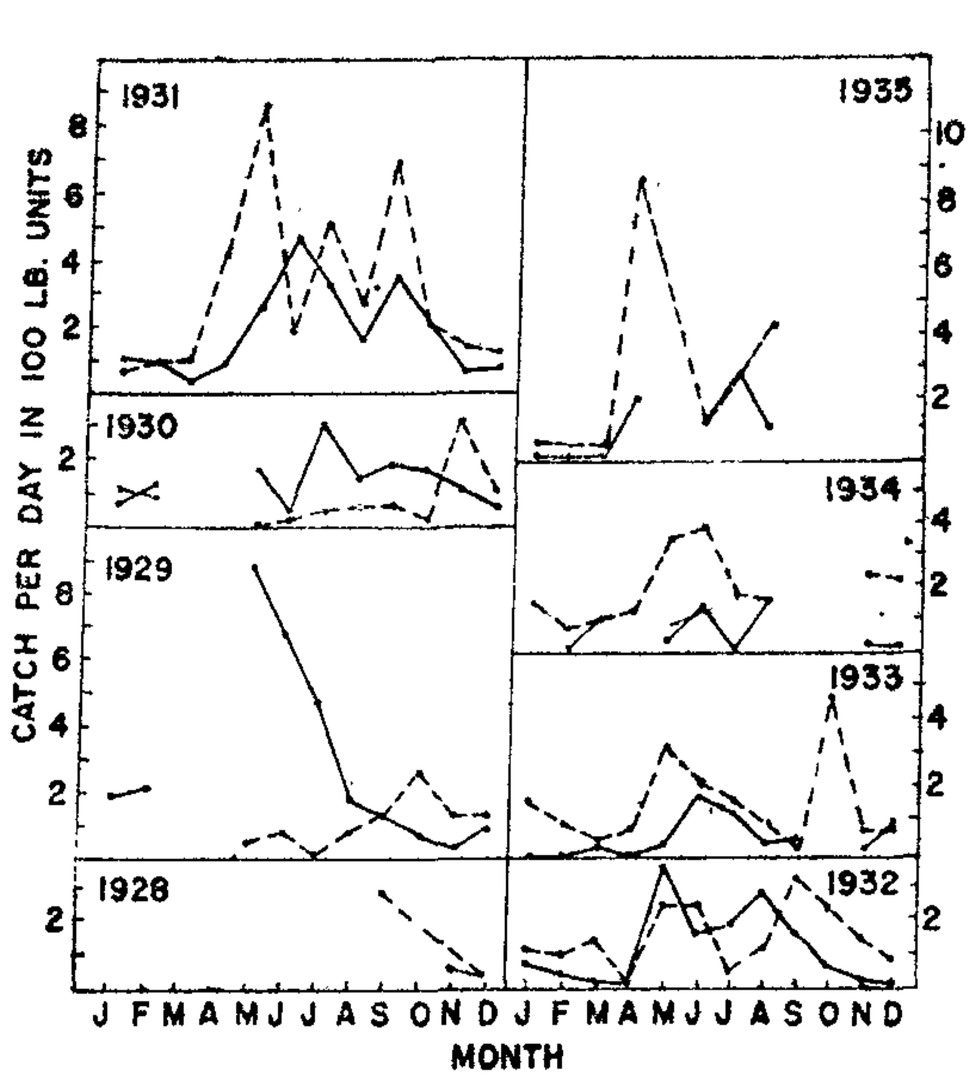


Fig. 1



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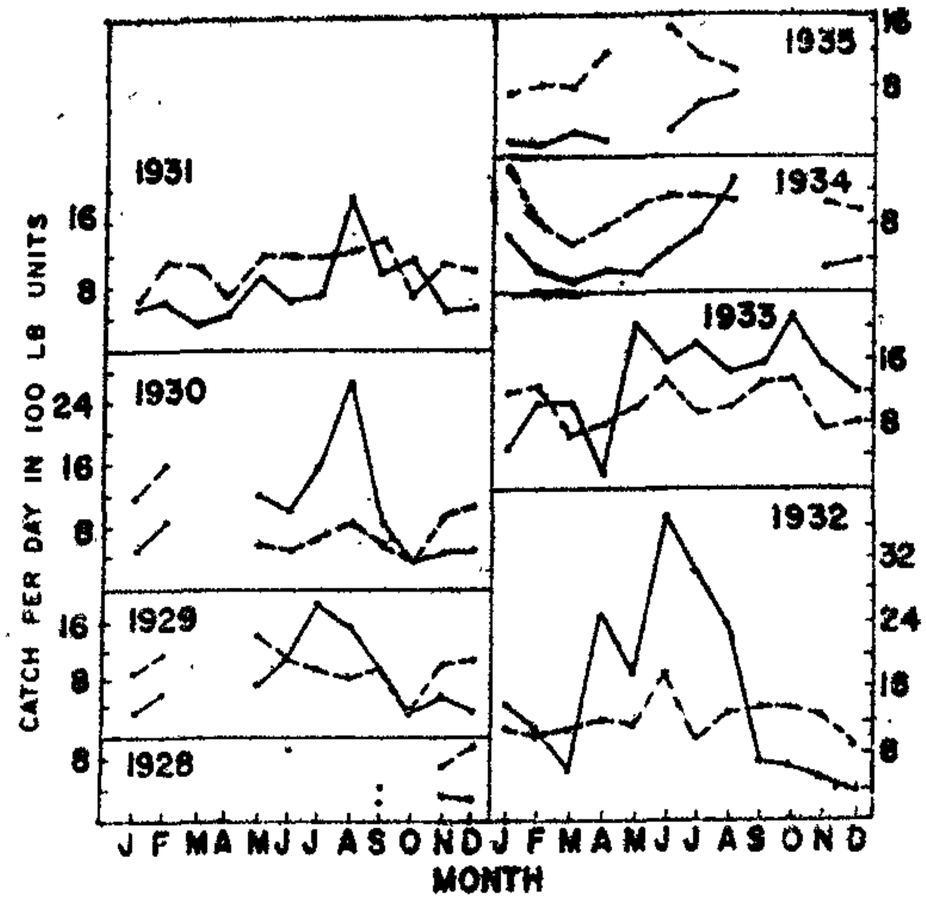

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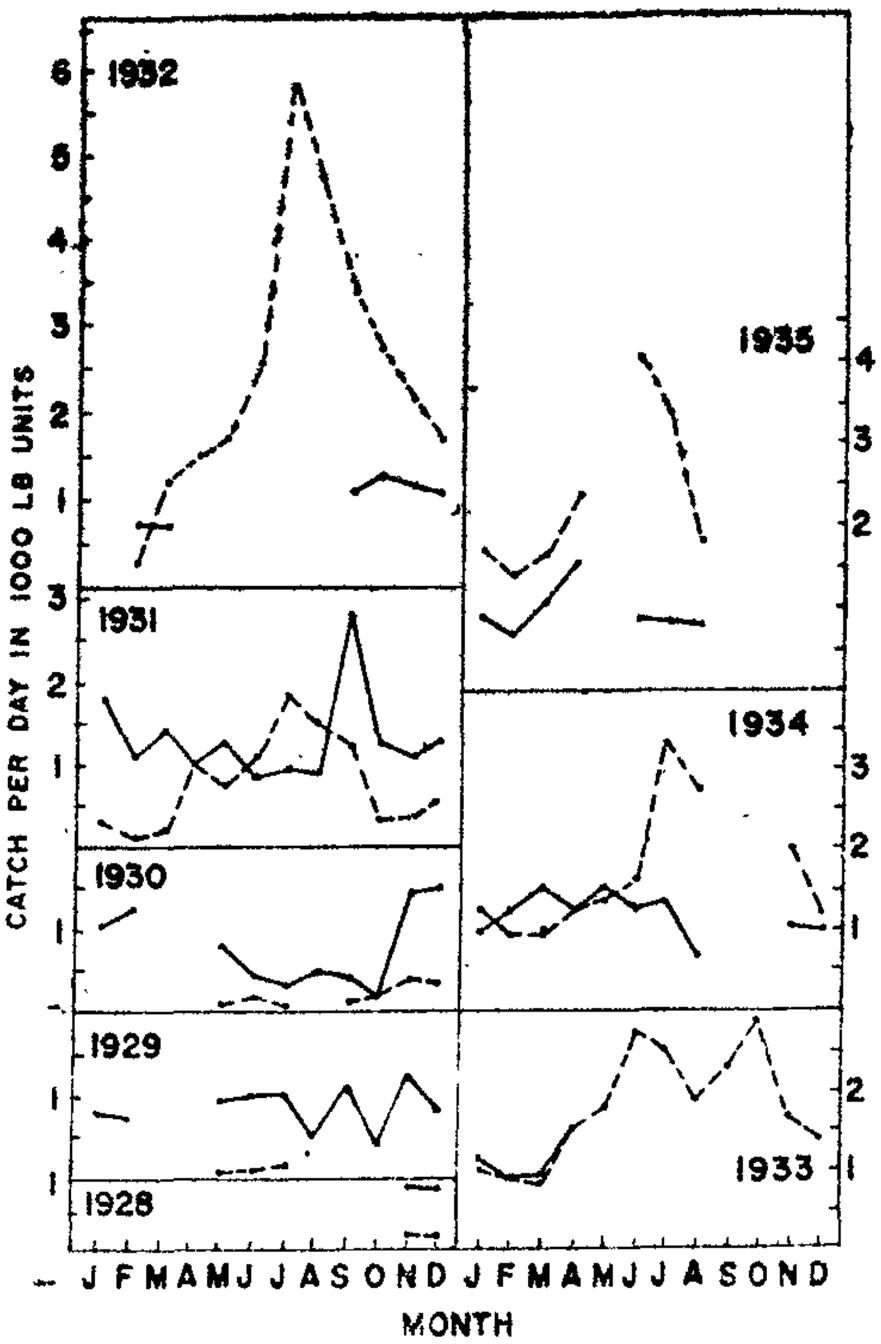


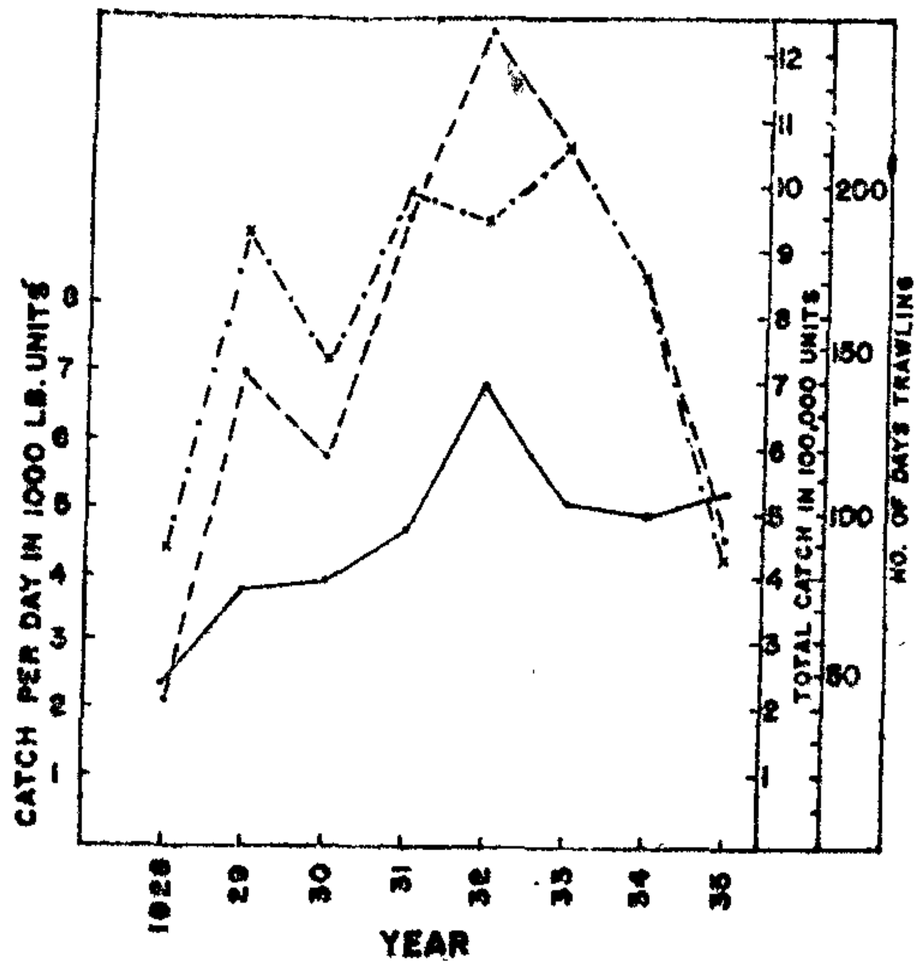
Fig. 4

Fig.1.—Variation in the total catch per day's trawling by months for the period 1928 to 1935.

Fig. 2.—Variation in the monthly catch of " Paraw " (solid line) and " Sharks " (dotted line) per day's trawling for the period 1928 to 1935.

Fig. 3.—Variation in the monthly catch of " Tambua " (solid linc) and " Laweya " (dotted line) per day's trawling for the period 1928 to 1935.

Fig. 4.—Variation in the monthly catch of "Mixed" (dottedline) and Meevatiya" (solid line) per day's trawling for the period 1928 to 1935.



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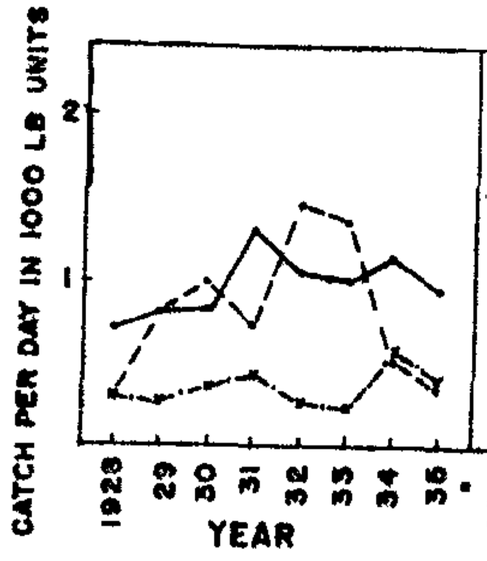

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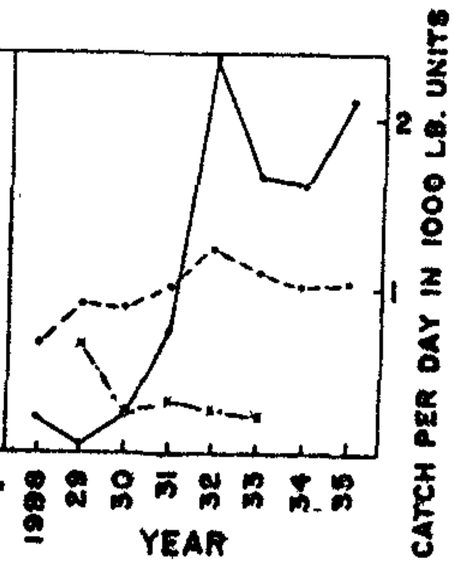

Fig. 7

Fig. 5.—Changes in the annual average catch per day (solid line), total catch (dash) and fishing effort (dots) from 1928 to 1935.

Fig. 6.—Variation in the annual average catch per day's trawling of " Tambua " (dash), " Meevatiya " (soild line) and " Sharks" (dots) 1928 to 1935.

Fig. 7.—Variation in the annual average catch per day's trawling of " Laweya " (dots), " Mixed (solid line) and pp " Paraw " (X).

TABLE I

Summary of the data of commercial fishing operations on the Wadge Bank from 1928 to 1935 (Figures in brackets inclusive of trips when part of the time was spent on activities other than fishing)

Year	1928	1929	1930	1931	1932	1933	1934	1935
Total catch in 100 lb. units ..	221·1	719·2	581·2 (599·6)	957·7 (1038·6)	1228·0 (1332·0)	1046·7 (1118·5)	858·1 (902·3)	492·4 (563·4)
No of days fishing* ..	89	185	147	199	188	209	171	92
No of trips ..	12	28	16 (17)	20 (22)	24 (26)	22 (24)	18 (19)	10 (12)
No. of days out of port* ..	101	213	163	219	212	231	189	102
Catch per day's fishing in lb ..	2484	3887	3953	4813	6899	5008	5018	5352
Proceeds per day's fishing in Rs	670	941	914	698	832	632	600	549
Proceeds per lb. landed in cts ..	27	24	23	15	13	13	12	10

*In calculating the No. of days fishing it is assumed that the No. of days taken to steam to the fishing grounds and back is one : Example—Trip No. 1 from May 21, 1928 to May 26, 1928—No. of days out of port is 5 and No. of days fishing is 4.

TABLE II

Comparison of the catch rates on Wadge and Pedro banks during February to April

Wadge Bank		Pedro Bank	
Year	Average catch in lbs per day's trawling during February to April	Year	Average catch in lbs. per day's trawling during February to April
1931	3522	1929	3642
1932	5074	1930	3811
1933	4267		
1934	3704		
1935	4426		