OBSERVATIONS ON FLOUNDERS *PLEURONECTES FLESUS* L. MARKED IN THE ESTUARIES OF THE TAMAR AND LYNHER

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Introduction

In the winter of 1937–8 just over a thousand flounders (*Pleuronectes flesus* L.) were caught, marked and released in the estuaries of the rivers Tamar and Lynher which flow into the west end of Plymouth Sound. The objects of this marking experiment were three. First, to discover the distribution and migrations of the adult flounders which had spent the years of immaturity in the estuaries. Secondly, to obtain observational, as distinct from inductional, data upon the growth of the species. Thirdly, to study changes in the distribution of the stock of immature fish within the estuaries.

The first object of the investigation was not fulfilled. There was but a very small number of returns from the open sea: this may be in part due to the great limitation of fishing along the south coasts of England which resulted from the outbreak of war some 18 months after the marking was completed. The two returns from localities at a distance from Plymouth do no more than hint at possibilities. The information obtained on growth gave proof that the individual variation in growth rates observed by Cunningham (1896) in captive fish was also to be found in the wild, and showed that there is relatively little growth in the winter months. The 152 recoveries of flounders within the estuaries have shown the existence of seasonal movements and redistributions of the fish of the immature stock. It is highly improbable that any more marked fish will be returned, and the results obtained are now summarized.

The Marking Experiment

The flounders were caught with a 'Saltash Tuck-net' (see Hartley, 1940). On the grounds around Saltash, 659 fish were marked in thirteen netting expeditions between 23 September and 26 November 1937, most of the work being done at night. At Sheviock Wood, on the Lynher, 327 fish were marked in three days' work on 21 and 24 September and 20 October 1937. On the night of 7–8 October 1937, 12 flounders were marked on the West Mud ground. In addition, on 24 February 1938, 41 flounders were marked at Saltash with disks taken from fish already returned. A map of the area will

be found in Hartley & Spooner (1938). Two places mentioned in this paper are not shown on the map. They are Cotehele, 2 miles up the Tamar above Halton Quay, and Calstock, which lies a mile upstream from Cotehele. Sandacre, also not marked on the map, is a spit of shoal ground in the Lynher below Forder Creek.

The flounders were kept in shallow baths of salt water until the strength of the tide put an end to fishing. Then each fish in turn was measured from the tip of the closed jaws to the end of the longest caudal ray, marked and at once released. There were no transplantation experiments. All the fish were released on the grounds where they had been caught and within an hour or two of the time of capture. The measurement was accurate to within $\pm 0{\cdot}5$ cm., this being the margin of error resulting from the measuring of a lively fish by the light of a hurricane lamp in an open boat on a winter's night. The marks were circular vulcanite disks of two sizes, 15 and 7·5 mm. in diameter. Two disks of the same diameter were used to mark each fish, a black disk to lie against the white under surface and a white disk, stamped with the initials PH and a serial number, to lie on the upper side. The white disk was placed with the numbered surface outwards. The disks were linked with a silver wire thrust through the dorsal musculature in the middle of the fish's length and about 1 cm. below the base of the dorsal fin. A little 'play' was allowed between the disks and the fish's flank, and in no case was any suppuration or necrosis of tissue found around the mark of a recovered specimen.

Printed posters were circulated to the waterside villages and to fishing ports, offering rewards for the return of marked fish.

148 flounders were returned between the beginning of marking and 5 May 1940, 116 of those marked at Saltash, 31 of the Sheviock fish and one from West Mud. Several marked flounders caught by Saltash fishermen were brought alive to the slip at that town. These fish were measured by Mr J. Gould and released a second time: seven were recovered again at a later date, and one was caught three times. Details of all recoveries are given in tabular form in the Appendix.

I am happy to be able to express my gratitude to Mr J. Gould for his help with the work of marking and the recording of recovered fish.

Recoveries at Sea

Of the four flounders recaptured in the sea two male fish, nos. PH 179 and 314 were found in 20–30 fathoms of water on the Looe-Eddystone ground, a known spawning area of the species a few miles south-west of Plymouth. A female fish, no. PH 497, was caught off Sharkham Point, south Devon, some 40 miles by sea to the east of Plymouth, and an unsexed fish, no. PH 815, was recovered 2 miles south of Brighton. This latter fish had made a journey of about 200 miles to the eastward.

Ehrenbaum (1908) found that flounders marked in the Elbe moved westward or south-westward along the coasts of the Low Countries, and had but one recovery from water more than 40 m. in depth. Redecke (1907) recorded the recovery of flounders, marked in the Zuider Zee, on the coasts of Belgium and France as far west as the mouth of the Seine. The two west-country flounders which had moved to a distance from Plymouth (if it be at all permissible to speculate on the import of evidence so small) had travelled in an opposite direction—to the eastward. Yet the emigrations of the flounders from the three areas had this in common, that they were all in the direction of relatively shallow water. Cunningham (1896) has remarked that this species is rarely found in more than 30 fathoms of water, and in the Baltic, Ehrenbaum (1911) observed that spent flounders moved away from the Bornholm Deeps to the shallows of the Pomeranian coast.

Growth

Some 80% of the flounders recovered were caught in the first 6 months after they had been marked, that is in the 'winter' period of October to March. Only a few of these fish had made good any appreciable growth in this period (Table I) within which the fast of the immature members of the stock also occurs (Hartley, 1940).

Table I. *Pleuronectes flesus*, the Flounder. Growth of marked flounders showing appreciable increment in length during the six winter months (October to March) immediately after marking

When a fraction of a month is to be considered, 16 days or more are counted as a complete month, 15 days or less are not counted.

No. PH	Date of marking	Length at marking (cm.)	Date of recovery	Length at recovery (cm.)	Increment in length (cm.)	Months since marking	Mean increment in length per month (cm.)
			Females				
9	21. ix. 37	24·2	30. xii. 37	25·8	1·6	3	0·53
328	3. xi. 37	27·0	3. ii. 38	28·0	1·0	3	0·33
			Males				
115	6. x. 37	22·5	1. ii. 38	25·2	2·7	4	0·675
193	13. x. 37	19·6	7. ii. 38	20·6	1·0	4	0·25
337	12. xi. 37	20·5	12. ii. 38	21·5	1·0	3	0·33
371	12. xi. 37	21·6	19. ii. 38	23·3	1·7	3	0·57
893	12. xi. 37	19·6	9. ii. 38	21·2	1·6	3	0·53

In Table II are shown the increases in length of all marked flounders which had been at liberty for more than 6 months, with the average increment per month of liberty and also the average increment per month of liberty between the months of April to September inclusive. These are the months of regular feeding and higher 'condition' (Hartley, 1940), and it may be inferred both

TABLE II. *PLEURONECTES FLESUS* THE FLOUNDER. GROWTH OF ALL MARKED FLOUNDERS WHICH HAD BEEN AT LIBERTY FOR MORE THAN SIX MONTHS, WITH INCREMENT IN LENGTH PER MONTH OF LIBERTY, AND ALSO INCREMENT FOR EACH 'SUMMER' MONTH (APRIL TO SEPTEMBER) AFTER MARKING

When a fraction of a month is to be considered, 16 days or more are counted as a complete month, 15 days or less are not counted.

No. PH	Date of marking	Length at marking (cm.)	Date of recovery	Length at recovery (cm.)	Increment in length (cm.)	Months since marking	Mean increment in length per month since marking (cm.)	'Summer' months since marking	Mean increment in length per 'summer' month since marking (cm.)
				Females					
4	21. ix. 37	35·4	11. ix. 38	36·2	0·8	12	0·067	6	0·13
61	24. ix. 37	36·4	7. viii. 38	36·5	0·1	10	0·01	4	0·025
65	24. ix. 37	36·6	26. vi. 38	36·6	0	9	0	3	0
76	24. ix. 37	27·4	12. ix. 38	31·2	3·8	12	0·32	6	0·63
112	24. ix. 37	18·6	10. vi. 38	21·2	2·6	9	0·29	3	0·87
236	13. x. 37	19·1	8. viii. 38	25·4	6·3	10	0·63	4	1·57
272	15. x. 37	20·3	3. vi. 38	21·0	0·7	8	0·09	2	0·35
276	15. x. 37	20·1	17. v. 38	20·6	0·5	7	0·07	2	0·25
296	20. x. 37	36·6	15. x. 39	39·75	3·15	24	0·13	12	0·26
298	20. x. 37	37·5	12. ix. 38	38·6	1·1	11	0·1	5	0·22
321	22. x. 37	26·2	17. v. 38	29·0	2·8	7	0·4	2	1·4
363	12. xi. 37	21·2	2. x. 38	30·6	9·4	11	0·85	6	1·57
380	12. xi. 37	19·8	29. vi. 38	23·2	3·4	8	0·425	3	1·13
391	25. xi. 37	20·0	5. v. 40	37·7	17·7	29	0·61	13	1·36
				Males					
57	24. ix. 37	26·6	14. viii. 38	29·4	2·8	11	0·25	5	0·56
268	15. x. 37	19·1	11. ix. 38	22·0	2·9	11	0·26	5	0·58
280	15. x. 37	20·9	3. vi. 38	22·4	1·5	8	0·19	2	0·75
445	25. xi. 37	23·0	2. v. 40	30·3	7·3	29	0·25	13	0·56
479	25. xi. 37	20·0	29. vi. 38	23·2	3·2	7	0·46	3	1·07
496	26. xi. 37	33·0	26. viii. 38	33·0	0	9	0	5	0
525	21. ix. 37	16·3	11. ix. 38	24·6	8·3	12	0·69	6	1·38
535	21. ix. 37	16·4	25. v. 38	16·9	0·5	8	0·06	2	0·25
619	6. x. 37	16·8	29. vi. 38	19·0	2·2	9	0·24	3	0·73
788	20. x. 37	11·8	14. viii. 38	18·2	6·4	10	0·64	4	1·6
888	12. xi. 37	17·7	11. ix. 38	25·0	7·3	10	0·73	5	1·46

from this fact and from the observed lack of growth in fish recaptured in their first winter that these are also the months when most, if not all, of the increase in size is made.

There is obviously great individual variation in both sexes, and it is not possible to make generalizations from these data, though it may be pointed out that the swiftest growth rates are shown by some of the smallest fish. Two flounders marked in Poole Harbour made growths of 8·5 cm. from a length at marking of 21·5 cm., and of 5·5 cm. from a length at marking of 24·5 cm., between 9 October 1925 and the end of May 1927 (Buchanan-Wollaston, 1933). The mean length increments per month of the two fish, 0·425 and 0·275 cm., and the mean increments per 'summer' month of 1·06 and 0·69 cm. are of the same order as those found in flounders from the estuaries of the Tamar and Lynher.

There is individual variation not only in the growth rates but also in the maximum lengths attained. Among the female fish, nos. PH 61 and 65 had reached their full growth of 36·4 and 36·6 cm. at the time of marking. Nos. PH 4 and 298 grew by 0·8 and 1·1 cm. in a year from lengths at marking of 35·4 and 37·5 cm., and no. PH 296 grew by 3·15 cm. in 2 years, although she was already 36·6 cm. in length when she was marked. Only one fully grown male fish was recovered, no. PH 496 which made no growth in 9 months from a length at marking of 33·0 cm.

Movements within the Estuaries

Flounders marked on the Saltash Grounds

Of the fish marked in the autumn on the Saltash grounds the greater number remained in the immediate vicinity through the winter. Those which did move away went short distances downstream to the shores of the Hamoaze. From the end of March onwards recoveries from the upper reaches of the estuaries, especially around Cotehele, began to come in suggesting a movement of part of the population upstream. It is generally believed by the local fishermen that there is such a spring movement away from the sea of those fish which will summer in the rivers, and the recaptures in the first summer after marking give concrete evidence of its existence. A female flounder, no. PH 240, for example, was marked at Saltash on 15 October 1937, recovered at the same place on 12 December and again released, to be taken a third time at Cotehele Quay on 7 April 1938; another female flounder, no. PH 272, also marked at Saltash on 15 October was recaptured and liberated again at the place of marking on 3 February 1938, and caught once more on 3 June 1938, at Cotehele Quay. It must, however, be pointed out that there is a great increase in the amount of netting in the upper reaches of the estuaries after the opening of the salmon season on 1 March and it is not certain that all the fish taken after that date well above the place of marking had but recently

moved away from the seaward grounds. Recoveries such as those of nos. PH 240 and 272 suggest that the redistribution of the stock does not take place until the spring, but do not prove it. The arithmetic mean length at the time of marking of the flounders which had moved downstream from the place of marking was 22·5 cm., and the arithmetic mean length of the fish which had gone upstream was 19·93 cm. The difference between these mean lengths is statistically significant, and confirms the existence of a reassortment of the stock before the breeding season, the larger fish going downstream to the sea, the smaller fish up the river to the more brackish stretches.

Only two flounders were recovered in the Tavy, a male fish no. PH 619 taken at Maristow on 29 June 1938, and a spent female no. PH 391 from Bere Ferrers in May 1940. The latter fish must have been down to the sea at least once to spawn. The two male flounders, nos. PH 268 and 888, marked at Saltash and recovered at Sheviock Wood may have been down to the sea to spawn, for both were large enough to have been mature fish.

Flounders marked at Sheviock Wood

Of the fish marked at Sheviock Wood a number moved downstream to the Hamoaze or to the last reaches of the Tamar at Saltash. Three of the fish which went downstream, a female no. PH 112 and two males, nos. PH 38 and 535, were recovered well up the Tamar in the spring and early summer after marking. All three were under 19 cm. long at the time of marking, and it is probable that they had taken part in the spring-time movement upstream from the Saltash marks. One fish, no. PH 14, was recaptured at St Germans, $1\frac{1}{2}$ miles upstream about 3 weeks after it was marked on 21 September 1937.

There is relatively little netting at Sheviock Wood and it was scarcely to be expected that there would be as many recoveries at the place of marking as were made at Saltash. A male fish, no. PH 59, was marked at Sheviock on 24 September 1937, and recaptured there on 20 October of the same year: by 11 January 1938, it had moved downstream to Petre's, in the Hamoaze. Two other male fish, no. PH 525 marked on 21 September 1937, and no. PH 788, marked on 20 October 1937, were recovered at Sheviock on 11 September 1938, and 14 August 1938 respectively. An unsexed flounder, no. PH 765, was marked at Sheviock on 20 October 1937, and recaptured there on 14 August 1938. The other flounders marked at Sheviock Wood and recovered on the same ground, or farther upstream, had probably been down to the sea and returned again.

Summary

1039 flounders were marked with numbered vulcanite disks in the estuaries of the Tamar and Lynher.

148 flounders were recaptured and of these seven fish were recovered a second time after one recovery and release, and one fish was recaptured on three occasions after two previous recoveries and releases.

Only two fish were recovered at a distance from Plymouth. Both had moved eastward, up the English Channel.

There was little or no growth in the winter months.

Individual growth rates were found to vary greatly.

The flounders living in the last reach of the Tamar near Saltash tended to remain in one limited area during the winter months, save for a drift downstream of some of the larger fish. In the spring there was an upstream movement of the smaller, immature fish.

Flounders which had gone down to the sea to spawn might return to the river in which they were marked, or to the other river of the two which join to form the Hamoaze, or they might move right away from the area where they were marked.

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APPENDIX

Recoveries of flounders marked in the estuaries of the rivers Tamar and Lynher 1937 *and* 1938

No. PH	Sex	At marking: Date (1937)	At marking: Length (cm.)	Recoveries: Where marked	Recoveries: Upstream of marking place	Recoveries: Downstream of marking place	Recoveries: Other localities	Length at recovery (cm.)
Marked at Saltash, river Tamar								
53	♀	23. ix.	22·5	15. x. 37	—	—	—	—
(Second recovery)				6. xii. 37	—	—	—	22·5
54	—	23. ix.	21·9	—	—	Keyham Creek 28. xi. 37	—	—
115	♂	6. x.	22·5	—	—	Keyham Creek 1. ii. 38	—	25·2
122	—	6. x.	18·7	15. x. 37	—	—	—	—
124	—	6. x.	20·8	13. xi. 37	—	—	—	20·8
126	♀	6. x.	18·1	—	—	Eastern Ground 7. x. 37	—	—
(Second recovery after release at Saltash)				*c.* 30. xii. 37	—	—	—	18·5
130	—	6. x.	19·3	—	—	Rats Island 14. x. 37	—	—
(Second recovery after release at Saltash)				14. x. 37	—	—	—	—
133	♀	6. x.	21·2	24. x. 37	—	—	—	21·4
136	♀	6. x.	19·6	7. ii. 38	—	—	—	—
(Second recovery)				9. ii. 38	—	—	—	—
(Third recovery)				26. ii. 38	—	—	—	19·8
137	♂	6. x.	21·8	—	—	West Mud *c.* 1. ii. 38	—	22·7
153	—	6. x.	19·4	15. x. 37	—	—	—	—
173	—	13. x.	26·6	18. xi. 37	—	—	—	—
179	♂	13. x.	24·9	—	—	—	Looe-Eddystone Ground 1. iii. 38	25·6
183	—	13. x.	22·4	—	—	Weston Mill Lake 23. xi. 37	—	—
188	♀	13. x.	22·7	25. xi. 37	—	—	—	—
(Second recovery)				24. i. 38	—	—	—	22·5
189	♀	13. x.	18·8	30. x. 37	—	—	—	18·8
193	♂	13. x.	19·6	7. ii. 38	—	—	—	20·6
196	—	13. x.	23·1	1. ii. 38	—	—	—	23·8
213	—	13. x.	22·2	9. i. 38	—	—	—	22·8
216	♀	13. x.	20·1	12. xi. 37	—	—	—	20·1
221	♀	13. x.	20·3	13. i. 38	—	—	—	19·5
229	—	13. x.	18·4	8. ii. 38	—	—	—	18·6
232	♂	13. x.	19·0	7. ii. 38	—	—	—	18·9
234	—	13. x.	18·8	3. ii. 38	—	—	—	18·5
236	♀	13. x.	19·1	—	R. Tavy 8. viii. 38	—	—	25·4
240	♀	15. x.	25·8	12. xii. 37	—	—	—	25·8
(Second recovery)				—	Cotehele Quay 7. iv. 38	—	—	25·5

No. PH	Sex	At marking: Date (1937)	At marking: Length (cm.)	Recoveries: Where marked	Recoveries: Upstream of marking place	Recoveries: Downstream of marking place	Recoveries: Other localities	Length at recovery (cm.)
250	—	15. x.	26·7	9. ii. 38	—	—	—	27·7
264	♀	15. x.	21·6	2. xi. 37	—	—	—	21·5
267	—	15. x.	23·9	10. i. 38	—	—	—	24·0
268	♂	15. x.	19·1	—	—	—	Sheviock Wd. R. Lynher 11. ix. 38	22·0
270	—	15. x.	24·4	9. ii. 38	—	—	—	25·4
272	♀	15. x.	20·3	3. ii. 38	—	—	—	20·7
(Second recovery)				—	Cotehele Quay 3. vi. 38	—	—	21·0
276	♀	15. x.	20·1	—	Cotehele Quay 17. v. 38	—	—	20·6
277	♀	15. x.	19·5	12. xi. 37	—	—	—	—
280	♂	15. x.	20·9	—	Cotehele Quay 3. vi. 38	—	—	22·4
283	—	15. x.	21·8	28. x. 37	—	—	—	22·0
287	♂	15. x.	21·7	—	Cotehele Quay 12. iii. 38	—	—	22·1
319	—	21. x.	26·2	21. i. 38	—	—	—	26·6
321	♀	22. x.	26·2	—	Cotehele Quay 17. v. 38	—	—	29·0
328	♀	3. xi.	27·0	—	—	Petre's 3. ii. 38	—	28·0
334	♀	12. xi.	19·8	10. ii. 38	—	—	—	20·0
337	♂	12. xi.	20·5	—	—	Weston Mill Lake 12. ii. 38	—	21·5
343	—	12. xi.	21·7	23. ii. 38	—	—	—	23·5
362	♀	12. xi.	24·8	5. ii. 38	—	—	—	25·4
363	♀	12. xi.	21·2	—	—	Cove Rock 2. x. 38	—	30·6
370	♀	12. xi.	21·4	—	—	Bull Point 21. xi. 37	—	21·4
371	♂	12. xi.	21·6	9. ii. 38	—	—	—	23·3
377	—	12. xi.	22·2	9. i. 38	—	—	—	22·4
380	♀	12. xi.	19·8	—	Cotehele Quay 29. vi. 38	—	—	23·2
391	♀	25. xi.	20·0	—	Bere Ferrers, R. Tavy 5. v. 40	—	—	37·7
409	♂	25. xi.	30·2	—	—	Henn Point 21. v. 38	—	29·7
434	♂	25. xi.	23·2	—	—	Lower Petre's 4. i. 38	—	23·5
435	—	25. xi.	24·2	12. xii. 37	—	—	—	24·3
437	♂	25. xi.	27·3	25. xii. 37	—	—	—	27·9
440	♂	25. xi.	23·1	—	—	Petre's 13. i. 38	—	23·5
442	—	25. xi.	22·3	12. xii. 37	—	—	—	22·3
445	♂	25. xi.	23·0	—	Hole's Hole 2. v. 40	—	—	30·3
448	♀	25. xi.	25·5	12. xii. 37	—	—	—	25·4
455	♀	25. xi.	22·5	30. xii. 37	—	—	—	22·5

No. PH	Sex	At marking: Date (1937)	At marking: Length (cm.)	Recoveries: Where marked	Recoveries: Upstream of marking place	Recoveries: Downstream of marking place	Recoveries: Other localities	Length at recovery (cm.)
460	—	25. xi.	21·8	23. i. 38	—	—	—	22·6
472	♂	25. xi.	23·5	30. xii. 37	—	—	—	23·4
475	—	25. xi.	22·6	30. i. 38	—	—	—	22·8
479	♂	25. xi.	20·0	—	Neill Quay 29. vi. 38	—	—	23·2
483	♂	26. xi.	22·4	16. xii. 37	—	—	—	22·4
488	♀	26. xi.	23·6	30. xii. 37	—	—	—	23·3
496	♂	26. xi.	33·0	—	Neill Point 26. viii. 38	—	—	33·0
497	♀	26. xi.	27·8	—	—	—	Sharkham Pt, S. Devon 24. iii. 38	27·8
568	♀	23. ix.	12·9	30. i. 38	—	—	—	13·0
616	—	6. x.	18·8	3. ii. 38	—	—	—	19·1
619	♂	6. x.	16·8	—	Maristow, R. Tavy 29. vi. 38	—	—	19·0
621	—	6. x.	16·6	15. x. 37	—	—	—	—
626	♂	13. x.	19·5	28. x. 37	—	—	—	19·8
628	♀	13. x.	16·7	—	2 miles below Calstock 23. iii. 38	—	—	17·3
630	—	13. x.	19·1	*c.* 2. x. 38	—	—	—	25·3
636	♂	13. x.	18·6	26. i. 38	—	—	—	18·6
645	♀	13. x.	18·5	5. ii. 38	—	—	—	18·9
650	♂	15. x.	13·1	—	Cotehele 29. iii. 38	—	—	13·6
652	♂	15. x.	11·3	26. ii. 38	—	—	—	11·9
656	—	15. x.	—	13. xi. 37	—	—	—	—
668	♀	15. x.	19·5	26. ii. 38	—	—	—	19·7
677	♀	15. x.	19·5	28. x. 37	—	—	—	19·6
682	♂	15. x.	19·1	12. xii. 37	—	—	—	18·9
685	♀	15. x.	19·3	—	—	Eastern Gd. 27. i. 38	—	19·4
698	—	15. x.	19·2	21. i. 38	—	—	—	20·1
700	—	15. x.	20·0	28. xi. 37	—	—	—	20·1
706	♀	15. x.	19·2	28. x. 37	—	—	—	—
707	♀	15. x.	21·0	11. xii. 37	—	—	—	20·8
711	♀	15. x.	20·3	—	—	West Mud 17. i. 38	—	20·9
800	—	21. x.	21·0	28. x. 37	—	—	—	21·1
815	—	22. x.	19·4	—	—	—	2 miles south of Brighton 10. iii. 39	28·0
821	—	22. x.	19·0	1. ii. 38	—	—	—	19·2
830	—	22. x.	17·0	2. ii. 38	—	—	—	17·4
845	♀	22. x.	12·0	25. xii. 37	—	—	—	12·5
869	♀	3. xi.	19·2	24. xi. 37	—	—	—	—
888	♂	12. xi.	17·7	—	—	—	Sheviock Wd, R. Lynher 11. ix. 38	25·0
893	♂	12. xi.	19·6	9. ii. 38	—	—	—	21·2
897	♂	12. xi.	17·9	4. ii. 38	—	—	—	18·5
911	—	12. xi.	18·5	9. i. 38	—	—	—	18·6
912	♂	12. xi.	17·2	30. i. 38	—	—	—	17·5
919	♂	12. xi.	18·6	7. ii. 38	—	—	—	18·7
920	—	12. xi.	17·0	10. ii. 38	—	—	—	17·2
929	♀	25. xi.	19·2	26. xi. 37	—	—	—	19·2
931	♂	25. xi.	19·3	28. i. 38	—	—	—	19·2

No. PH	Sex	At marking: Date (1937)	At marking: Length (cm.)	Recoveries: Where marked	Recoveries: Upstream of marking place	Recoveries: Downstream of marking place	Recoveries: Other localities	Length at recovery (cm.)
947	♀	25. xi.	21·0	18. xii. 37	—	—	—	20·8
948	—	25. xi.	19·4	26. i. 38	—	—	—	19·2
949	♀	25. xi.	20·6	27. ii. 38	—	—	—	20·5
962	—	25. xi.	17·3	9. ii. 38	—	—	—	17·1
963	♀	25. xi.	21·0	12. xii. 37	—	—	—	21·4
980	♂	26. xi.	19·7	11. xii. 37	—	—	—	19·6
983	—	26. xi.	18·7	8. i. 38	—	—	—	19·0
987	—	26. xi.	18·0	7. ii. 38	—	—	—	18·2
216/2	♀	26. xi. (1938)	22·5	25. xii. 37	—	—	—	22·3
59/2	♀	24. ii.	21·5	—	Cotehele Quay 23. v. 38	—	—	22·1
370/2	—	24. ii.	18·5	—	Cotehele 14. iii. 38	—	—	—
448/2	♀	24. ii.	17·5	—	2 miles below Calstock 23. iii. 38	—	—	17·2
592/2	♀	24. ii.	13·7	27. ii. 38	—	—	—	13·6
Marked at West Mud								
160	—	(1937) 7. x.	17·2	Recovered at Saltash, 27. x. 37.				
Marked at Sheviock Wood, River Lynher								
4	♀	21. ix.	35·4	11. ix. 38	—	—	—	36·2
5	—	21. ix.	22·6	24. ix. 37	—	—	—	22·6
9	♀	21. ix.	24·2	—	—	Weston Mill Lake 30. xii. 37	—	25·8
14	—	21. ix.	23·6	—	St German's Quay 15. x. 37	—	—	—
20	—	21. ix.	19·4	24. ix. 37	—	—	—	—
38	♂	21. ix.	18·9	—	—	—	Hole's Hole, R. Tamar 20. iv. 38	17·8
57	♂	24. ix.	26·6	14. viii. 38	—	—	—	29·4
59	♂	24. ix.	23·5	20. x. 37	—	—	—	—
(Second recovery)				—	—	Petre's 11. ii. 38	—	23·9
61	♀	24. ix.	36·4	7. viii. 38	—	—	—	36·5
65	♀	24. ix.	36·6	—	—	Henn Point 26. vi. 38	—	36·5
74	—	24. ix.	24·3	—	—	Saltash 9. i. 38	—	25·0
76	♀	24. ix.	27·4	—	St German's Quay 12. ix. 38	—	—	31·2
86	♂	24. ix.	25·1	—	—	Saltash 8. xi. 37	—	25·0
102	♂	24. ix.	23·2	—	—	Cove Rock 11. i. 38	—	23·7
112	♀	24. ix.	18·6	—	—	—	Halton Quay, R. Tamar 10. vi. 38	21·2

No. PH	Sex	At marking: Date (1937)	At marking: Length (cm.)	Recoveries: Where marked	Recoveries: Upstream of marking place	Recoveries: Downstream of marking place	Recoveries: Other localities	Length at recovery (cm.)
288	—	20. x.	35·1	—	—	Eastern Ground 30. xii. 37	—	35·2
293	—	20. x.	35·2	—	—	Saltash 3. vi. 38	—	—
296	♀	20. x.	36·6	—	—	Saltash 15. x. 39	—	39·75
298	♀	20. x.	37·5	—	St German's Quay 12. ix. 38	—	—	38·6
310	♂	20. x.	24·4	—	—	Henn Point 4. ii. 38	—	24·6
314	♂	20. x.	27·3	—	—	—	Looe-Eddystone Ground 15. ii. 38	30·2
317	—	20. x.	23·6	—	—	Rat's Island 25. xi. 37	—	—
513	—	21. ix.	16·6	24. ix. 37	—	—	—	—
525	♂	21. ix.	16·3	11. ix. 38	—	—	—	24·6
535	♂	21. ix.	16·4	—	—	—	Cotehele Quay, R. Tamar 25. v. 38	16·9
558	♀	21. ix.	15·8	—	—	Sandacre 1. x. 37	—	—
592	♂	24. ix.	15·1	—	—	Keyham Creek 13. i. 38	—	15·1
758	—	20. x.	17·6	—	—	Cove Rock 24. i. 38	—	17·5
765	—	20. x.	17·9	17. xii. 37	—	—	—	—
775	♀	20. x.	19·1	—	—	West Mud 4. i. 38	—	19·3
788	♂	20. x.	11·8	14. viii. 38	—	—	—	18·2

A number of the flounders marked by Ehrenbaum (1908) showed an apparent *decrease* in length between the times of marking and recovery similar to that shown by several of the fish from the Tamar and Lynher.