

FURTHER NOTES OF EVIDENCE *RE* MULLET.

I left for Auckland on the 30th December, 1895, for the purpose of further investigating the breeding habits of the grey mullet in the northern parts of New Zealand. At Napier I made inquiries in passing, as a considerable supply of fish has been sent from there to the Wellington market by rail, in boxes, twice a week since September, and these boxes frequently include mullet. On the 15th November one lot which I examined were all undeveloped females in prime condition, weighing 25 oz. each, and on the 22nd November a similar lot. On the 11th December a lot received from Napier proved to be all males, quite undeveloped, but of large size, weighing from 26 oz. to 30 oz., and in prime condition. Both lots were clean fish, the intestines being empty, and the pharynx containing only a few drops of grey slime, consisting of deep-water forms of minute marine Crustacea and Diatomacea (*zygoseris*). I was informed at Napier that such fish are caught in the trawl-net, which is used outside the harbour beyond the Pania Reef. I found that at this date also the Napier market was supplied with mullet in excellent condition. These fish were therefore caught during what is the close season in other places, and were yet in excellent condition for use as food. On the 2nd January, in Auckland, I found a few mullet exposed for sale, of small size and very poor condition, and not fit for food. An early visit to the wholesale fish-market, on the 3rd January, discovered no mullet offered for sale, but mullet were served at table on the same day, and were not palatable; so that, so far as Auckland consumption is concerned, it would really be in the interests of the community to prohibit the sale at this season. On the 23rd January, as I returned, I still found inferior fish exposed for sale, and, although they were gutted and scaled, it was evident that they were spawning fish. So far as I could ascertain, the mullet supplied to Auckland mostly comes from the Hauraki Gulf, and a small proportion of much better quality at this season from Helensville. I saw a consignment of seventeen dozen very fine prime fish brought down to Auckland on the above date.

On the 4th January I arrived at Whangarei, and had a brief interview with Mr. John Monro, the Inspector of Fisheries for the district, at Marsden Point. As Mr. Monro has been the original instigator of this investigation, and has had very long experience in everything relating to fisheries, we agreed that it would be advantageous that I should consult with him, after having obtained all the information I could in other districts. I therefore went on to Whangarei, and happening to make the acquaintance of Mr. Easter-Brook Smith, he put me in touch with the fishermen.

4th January, 1896 (Whangarei).—*Edward Blake*: Has fished mullet for twenty-two years, and for the last fifteen years in the upper reaches of the Whangarei Harbour and River. The fish are now harder to get than formerly, but not really scarcer. They are more disturbed. This year they are as plentiful as ever; but years vary very much. Fish with hard roes are generally found up the river about Christmas, but this year they are much later, probably owing to last winter being so cold. By "hard roe" is meant when the eggs are distinct and firm when cooked. They have undeveloped roes at other seasons, but have never seen any hard roes later than the end of January. Have never seen mullet-spawn lying on the banks of river or anywhere else. Mr. J. L. Wilson has told me that the sea at Parua Bay has frequently been covered with floating spawn. Cannot say if it was mullet-spawn (most probably flat-fish spawn). Young fish which are supposed to be mullet are first seen coming up the river on fine days in spring time—October and November. They increase rapidly in size when the warm weather comes. Large and small fish run separately; all the fishermen know this, and use different-sized nets. Large fish mostly keep to the deep channels; but on warm days, even in winter, the large fish sometimes come on to the banks. In summer the fish move everywhere, but from March on through the winter months either a big haul is taken or none at all, as they are then running in "schools." Have never seen any spent fish but have occasionally caught fish with roes fully ripe for shedding coming down the creeks. Have never seen any mullet that I would not have eaten. Never caught any foul or muddy fish in Whangarei. Shags are the chief enemies of the mullet, as they eat great quantities of the young fish. Think any regulations for mullet-fishing are quite unnecessary for Whangarei. The mullet are quite able to take care of themselves, owing to the harbour having deep channels, in which there are strong tidal currents, so that nets can be set only in the dead-water at high and low tide. In the deep water we have to wait and watch the channels at high and low water slacks. All the nets used are sinking-nets—that is, the sinker a little stronger than the floats. The mesh varies from  $3\frac{1}{2}$  in. to  $4\frac{1}{4}$  in., but very few fish are caught with the latter. No fish caught with a mesh less than 3 in. would be worth taking. That would be a mullet less than 12 in. long and about 12 oz. in weight before being cleaned. The mullet-fishing is best in northerly winds and worst in southerly. No part of the harbour should be closed as a spawning-ground at any season. About three weeks ago—10th December—some large mullet with hard roes were caught outside the heads with a  $4\frac{1}{2}$  in. mesh. These were of the large blue-backed kind that are rarely seen in the harbour, but are reported to be in great shoals outside.

*Note*.—In the afternoon Mr. Blake arrived with a take of very fine mullet which had been caught with a  $3\frac{1}{2}$  in. mesh net in the reach above the Railway Wharf during the first of the flood-tide. I cut up and examined forty of these, and found five to be males and thirty-five to be females. In no case were the sexual organs more developed than those I examined at the end of October. The largest fish in the lot was a female—length 16 in., and weight 22 oz. The ovaries were 3 in. long but were quite undeveloped, of a deep purple-red colour, without any appearance of segmentation. The smallest fish was a male, 12 in. long and 12 oz. weight, milt undeveloped. The smallest female was 14 in. long, 16 oz. in weight, and with undeveloped ovaries  $1\frac{1}{2}$  in. long. All the fish were in prime condition, quite clean, and very fat.

14th January (Whangarei Heads).—*John Munro*: Thinks there should be a close season for mullet when in full ripe roe. Does not know when that season is. Used to think that all the mullet spawned up the creeks, but has made no observations to prove this, and rather doubts it now, as large fish in spawn are found outside the Heads when none such are caught inside at the