Dredge-oysters.

The Foveaux Strait oyster-dredgers had a satisfactory season. Five steamers were continuously employed. Except when the boats were hindered by stormy weather, supplies were landed fairly uniformly throughout the period March to October inclusive. About 99 per cent. of the oysters were obtained from the eastern area, and about 88 per cent. of the total supplies came from the East Bed, which apparently continued to yield good catches to the end of the season. The total landings amounted to 38,793 sacks, valued (wholesale) at £29,095.

Toheroas.

The toheroa-beds on the North Kaipara Beach and on the Ahipara (Ninety-mile) Beach are well stocked, and appear capable of comfortably meeting the demands of the established canneries and the normal picking by the public. At times supplies find their way into the Auckland fish-shops, but we have no means of obtaining returns of the quantities which are supplied for sale. It is desirable that all persons exploiting these and other shell-fish for commercial purposes should do so under license. We still lack that comprehensive and quantitative knowledge of the Dominion's toheroa resources, obtainable by an organized survey of the beds, which is desirable as a basis for the best administration of this fishery and for the guidance of its future exploitation. During the last season 2,030 cases, valued (wholesale) at £5,260, were packed at the two canneries.

Quinnat Salmon.

The collection of ova for the Hakataramea Hatchery was again confined to the Hakataramea River. The rack was completed on the 18th April, and the first of the fish for stripping were taken on that date. Steady catches were obtained till the 28th April, when an exceptionally high flood came down and swept away the rack. The river continued high until the 8th May, when a pound net was erected, which remained in operation till the 23rd May. 603 fish were taken for the hatchery, of which 285 were males and 318 females. The total number of eggs put down to hatch was 1,300,000. On reaching the "eyed" stage 500,000 were sent to the Maori Creek Hatchery, Te Rou, for continuing the stocking of the River Wairau (Marlborough); 400,000 were sent to the Westland Acclimatization Society for continuing the stocking of the Hokitika River system; 150,000 were sent to Tasmania; the balance were hatched out and liberated as fry in the Hakataramea, with the exception of 12,000 kept for rearing to the yearling stage in the ponds.

The spawning run of quinnat salmon in the Waitaki and its tributaries in the winter of 1928 was judged to be the biggest which has yet appeared. The Ahuriri and Otamatata Rivers especially held considerable numbers of fish, and salmon were seen spawning in small creeks where they had never previously been seen. Increased numbers were also reported to be present in the waters of the upper Clutha, especially in the Motukituki tributary, and in the Hunter and Dingle Rivers at the head of Lake Hawea.

A few definite cases of quinnat spawning in the Wairau River (Marlborough) were observed in the 1928 season, indicating that the fry that have been planted yearly since 1921 have produced a certain return of adults. In addition to a first assignment of 500,000 ova to the newly erected hatchery for the Wairau in 1917, a total of 4,750,000 ova has been utilized for the stocking of this river since 1921, making an average of 593,750 each year for the last eight years. The results have not come up to the expectations entertained when the stocking of this river was undertaken. There are two sets of conditions either or both of which may have been mainly concerned in producing a relatively unsuccessful result from this experiment. Maori Creek, where the hatchery is located, flows into Timms Creek, which joins the Wairau River in its middle or lower course. The upper tributaries of the Wairau, which would probably afford more suitable and more ample feeding-grounds for the young quinnat, have thus never been stocked.* This may have limited the number of "smolts" which would survive to make their way to the sea. However, I do not think that this could have been the decisive factor. It appears more probable that the conditions in the sea off Marlborough are less suitable for the species than is the case off the coast of Canterbury and Otago. It is known that off the south-eastern coasts of South Island the water in the sea is of Antarctic origin. There is a general set or drift in a north-easterly direction of cold water from the south, and this water produces the prevailing conditions in the sea off the Otago and Canterbury coasts where the quinnat have been established for some years. The South Equatorial Drift, which sets from the eastward and impinges upon the east coast of North Island, may be said to dominate the conditions to the northward of East Cape; while between that point and Cook Strait there is a mixture of this subtropical water with water from the south. For a long time navigators have been familiar with these "sets" or surface movements of the sea, but it was not until the Danish research steamer "Dana" had applied physical and chemical tests to the water sampled at intervals between the east coast of Auckland and the coast of Otago, in January, 1929, that the significant differences in the character of the water along this line were ascertained. It seems clear from the "Dana's" observations that the present distribution of quinnat salmon off the New Zealand coasts coincides with the occurrence of practically unmixed Antarctic water, with its characteristic physical and chemical qualities. Not a single individual of the quinnat species has ever been planted in a Canterbury stream, yet the Canterbury rivers now provide the best quinnat-fishing in the Dominion, the species having migrated to their mouths from the Waitaki, where the original fry were planted. The Wairau has been fairly generously stocked and yet shows no appreciable run of fish. The inference is that it is probably too far north—outside the influence of the purely Antarctic water which attracts the bulk of the species—though an odd few are known to run into the Wairau, and, in fact, into some of the southern rivers of the North Island. This season an indubitable quinnat was caught in the Tukituki River, Hawke's Bay. It does not follow that these

* It should be added that at the time when the Maori Creek Hatchery was established it was impossible to obtain access by road to the upper waters of the Wairau system.