

Dr. Malcolm, Professor of Physiology in Otago University, has continued his researches on the food values of fishes, and has also been engaged on a research on the seasonal variations in the composition and food value of the Foveaux Strait oysters. He has been assisted by Mr. Young in connection with the supply and grading of his material.

TOHEROAS.

In connection with an investigation by Messrs. Hefford and Young of the toheroa-beds on the Riverton Beach (Southland), a number of these molluscs have been under examination at the station. They have been supplied with tow-nettings to furnish the food necessary for their sustenance. It has proved difficult, however, to imitate the natural conditions in which they live on an open surf-exposed beach, and at the end of eight months only a small proportion have remained alive.

SPRATS.

The occurrence of these fish on the coast of Otago has been most erratic throughout the year. They have been reported by fishermen on several occasions as having been seen in various localities, chiefly in the vicinity of Cape Saunders. Mr. Adams states that the shoals were probably of small size, and did not remain for any length of time on the surface. He reports that "On several occasions after receiving a report from fishermen as to the position of these small fish we have lost no time in going to the spot where they were last seen. We have, however, always arrived to find that there were no signs of sprats on the surface, and, with the exception of those taken from the stomachs of other fishes, no others were seen. Sprats were plentiful on the bottom during June and July. The stomachs of all fish caught off Cape Saunders during these months contained large quantities of them. When trawling off Hayward's Point a small number of sprats was caught in the trawl net. On one occasion (in January) the lighthouse-keeper at Cape Saunders informed me by telephone that large quantities of sprats were being washed ashore. As there was a southerly gale blowing at the time, nothing could be done."

HYDROGRAPHIC WORK.

Owing to the exceptionally unsettled weather experienced during the greater part of the year, all work outside Otago Heads was much hampered, and the regularity of observational and collecting work was interfered with. Two fixed stations were selected early in the year, one at Cape Saunders and the other about two miles east of Otago Heads, and at these water-samples were taken as regularly as possible by Mr. Adams and handed over to Mr. Young, and temperatures were also recorded. Mr. Young took a further series of water-samples from the ponds previous to the oyster-transplantation experiment. Mr. Oliver, of the staff of the Dominion Museum, also collected a series of samples during the cruise of the "Tutanekai" to the southern islands, and at all stations temperatures were recorded. These samples have been titrated for salinity only, as there is no provision for full water-analysis at the station. Professor Inglis, of Otago University, kindly supplied the necessary standard solutions for testing salinity. The results of all these examinations form the subject of a special report by Mr. Young to the Department.

DRIFT BOTTLES.

Mr. Young reports: "A total of 252 drift bottles were liberated during the year. With the exception of a series liberated by Mr. Oliver on the southern-islands cruise, these bottles were cast adrift in the vicinity of Foveaux Strait. Captain Bollons liberated a series at the western extremity of the strait, and Mr. N. Beer, of Riverton, put out two small lots in the Centre Island area at the beginning of the experiment. The majority of the bottles were liberated either by myself or by members of the crew of the 'Despatch' on the oyster-beds. Returns are to hand from as far north as the estuary of the River Avon. The total number returned to date is 6 per cent., which, considering the nature and extent of the coast-line, is quite good. There is also a probability of some of the bottles liberated well off shore being retained by the ocean currents and never being cast up."

GENERAL STATION WORK.

Throughout the greater part of the past year, owing to the unsettled weather, the sea-bottom outside Otago Heads at a depth of 5 to 15 fathoms has been covered with a quantity of loose drift weed carried along the coast by stormy weather. Owing to this foul condition of the ground, less time has been spent in trawling than in previous seasons. A trawl was lost on one occasion when working in Blueskin Bay; the weight of weed proved too much for the net, which parted close to the boards, leaving only the otter-boards and chain to be lifted. In deeper water than 20 fathoms, well off shore, the ground was fairly clean, and, though flat fish were not plentiful, the catches taken by the large trawlers were larger than those recorded during the previous year. The Board's boat made hauls with the trawl on all suitable occasions from Papanui Head to Blueskin Bay, to a depth of 15 fathoms. Line fishing was carried out mostly in the vicinity of Cape Saunders, as a greater variety of fish is usually caught there than at any other part of the local fishing-grounds. Descriptions of all fish taken by trawl, seine, or line fishing, with locality and condition, were noted, and examination of all stomach-contents was carried out. Mr. Adams reports that "During the spring and summer months there was a marked absence of the minute pelagic life which is usually to be seen in large quantities both inside and outside of Otago Heads. The scarcity was more noticeable in the vicinity of Cape Saunders. Vast numbers of jellyfish of minute size are often to be seen during the summer months being carried north by the current, which, after passing the Cape, sweeps away from the coast. It is also a common