when disturbed by larger predatory fish, especially barracouta. Twice in January, Mr. Scofield, lightkeeper at Cape Saunders, rang up the station by telephone to say that large shoals of sprats were in the surf close under the cliffs at the cape, but the heavy weather which prevailed at the time prevented the launch from going out. During February last, when Mr. Broadley visited the southern fishing-ports, he reported that sprats were exceptionally plentiful for a considerable distance both north and south of Nugget Point. Mr. Adams stated in his annual report that "there is no doubt that large numbers of sprats pass and repass the coast from Cape Saunders to Moeraki many times during the season. It would appear, however, that the strong current, running north, which flows close to Cape Saunders and then shoots off the Peninsula, carries the sprats some distance off the coast. The velocity of the current varies, running at times almost slack, while again, though less frequently, the flow is in a southerly direction. It is possible, therefore, that when the current is not running strong, small fish would more easily get clear of the flow and so work closer to the shore. During the past four years the appearance of sprats on the surface between Cape Saunders and Otago Heads has been very rare."

Biological Work.

Owing to Mr. Young's transfer from the employment of the Board to the Fishery Branch of the Marine Department, that gentleman left Portobello for Wellington in September, and the Board is now without the assistance of a resident biologist. Meanwhile the material which the biologist has hitherto handled is being regularly forwarded to Dr. Harold Finlay, who—thanks to the kindness of Professor Benham—is working in the laboratory of the University Museum, Dunedin. This material consists of surface tow-nettings, contents of fish-stomachs, scales and otoliths, the two last for estimation of the ages of the fish examined. In previous years, as recorded in the bulletin published in 1921, the food of the local fishes has been noted to a very considerable extent. Dr. Finlay's work in this direction is a continuation of that formerly done by the late Mr. T. Anderton and by Mr. Young.

In regard to the scales and otoliths, Dr. Finlay reports as follows: "Scales and otoliths (from the same fish) have been received and examined from the common sole (*Peltorhamphus novae-zealandiae*), sand-flounder (*Rhombosolea plebeia*), greenback flounder (*Rhombosolea tapirina*), lemon sole (*Pelotretis flavilatus*), brill (*Ammotretis guntheri*), and kelp-fish (*Coridodax pullus*). It has been found impossible, with the methods available, to make any headway in the study of these scales. Those of the common sole and kelp-fish at first sight seem to be readable, and occasional scales are met with which seem to indicate a definite number of zones. But under ordinary high-power microscope examination these prove to be quite inconstant even in scales from the same fish, and scales from different fishes vary hopelessly in their appearance. I am unable to feel certain of any readings so far on these sclaes. Different methods of staining (eosin, silver nitrate, &c.) decalcifying and mounting in gum arabic, glycerine jelly, or water-glass preparation, have been tried, also examination by reflected light under a binocular microscope and by polarized light, but without success. It is possible that a method such as Creaser's, whereby the image of the scale, enormously magnified, is thrown on to a screen where the successive distances between rings can be accurately measured, might be successful, but there are no facilities available for this as yet.

"The otoliths are, on the whole, much more promising, and are generally fairly clear, the inmost ring being sometimes obscure. Sixteen examples from the common sole, from fish 10 in. to 19 in. long, give readings rising more or less uniformly from two years and a half to four years. Ten examples from the sand-flounder (8 in. to 14 in.) rise from two to three years; three from the greenback flounder (12 in. to 14 in.) all indicate about two years and a half; eight from the lemon sole (10 in. to 13 in.) increase from three to four years; and two examples from the brill (10 in. to 15 in.) show two to four years. The only two otoliths seen from the kelp-fish have been too obscurely marked to read. All the otoliths have been read either completely immersed in eosin solution, or else lying on a dead-black surface."

Hydrographic Work.

The collection of water-samples, recording of thermometric readings, and observation of ocean currents have been carried on weekly throughout the year, except for interruptions due to heavy weather. These interruptions were somewhat frequent for the four months April to July. The Board's launch, the "Karoro," though an excellent sea-boat, is not sufficiently heavily engined to work in rough water.

In August last Mr. Scofield, lightkeeper at Cape Saunders, kindly undertook to co-operate with the station, and he has carried on both branches of the work regularly. Up to the time of his leaving for Wellington Mr. Young titrated all the sea-water samples for estimation of salinity. This work has, since September, been undertaken by the officers of the Dominion Laboratory, and is being carried out at present by Mr. James, who is in charge of the Branch Laboratory in Hanover Street, Dunedin. As stated in last year's report, these samples have been titrated for salinity only, as there is no provision for full water-analysis yet.

The Chairman of the Board has recently brought before the notice of the Chief Inspector of Fisheries the desirability of obtaining samples of sea-water for salinity from points right round the New Zealand coasts. At the present time the vessels of the New Zealand Navy take observations of marine temperature every six hours during their cruises. The results of these observations, if communicated to the Department of Fisheries, could ultimately be worked out, and would be of great value. It would also be quite easy to get samples of water at the same time, and the officers of the Navy Department have expressed to the Chairman their willingness to further this scheme. It depends, however, in the first place on the supply of a sufficient stock of collecting-bottles. It is to be hoped that this question will be followed up, as the co-operation of the Navy in marine scientific work would be of great value.