

length of 9 in. to 10 in. they seek the deeper water for their breeding-ground. In the turbot-tank there is only a depth of 20 in., and I am of opinion that the insufficient depth is the sole reason why the turbot have not already spawned. Turbot spawn in 20 to 30 fathoms, and the conditions at this depth would be totally different from those of the shallow water in our tanks.

"At the time of my last annual report the stock of lobsters stood at five males and two females. One male and two females died during the year. The cause of death was not apparent. [Presumably old age was the cause.—G. M. T.] The female had but recently cast her shell after having hatched out a full bunch of eggs. The remaining two females hatched out their broods during February, one casting the same month and the other early in March. All the larvæ were hatched out in the large pond, and were allowed to escape by the outlet-valve, which is opened at least once daily. I estimate that 30,000 larvæ were hatched during the season. The few lobsters we have in the ponds require almost as much time in tending them as it would take if the ponds were fully stocked. The ponds require to be regularly cleaned, and a fresh supply of fish-food secured three times a week.

"It is now two years since we started to experiment in the rearing and cultivation of the southern rock-oyster (*Ostrea tatei*). Our first attempt was not a success, owing to the rapid growth of weed on the concrete slabs. The following season we altered the racks so that two-thirds of the slabs were in a horizontal position, and the remainder lying at an angle of 45°. The rack was close-boarded on top so as to exclude as much direct sunlight as possible. During February the plates were examined, and it was found that the under-sides of those lying on their flat were covered with oysters measuring 1 in. in diameter, while the plates lying at an angle, although free from weed, had very few oysters attached. Our past experience has shown us that to make this experiment a success the plates need to be placed in a horizontal position and kept as dark as possible during the spawning season."

*Drift Bottles.*—Since January, 1920, when the liberation of bottles off Otago Heads was commenced, 464 bottles have been set free. Of these sixty have been picked up, and their contained papers have been returned to the Hon. Secretary of the Board. This represents 12.9 per cent. of the whole number, and, considering the fact that all bottles liberated more than six miles from the heads drift north (as far as Wellington) and north-east (three having been returned from the Chatham Islands), and that the chances of the bottles being picked up on sandy beaches seem relatively small, we consider the results both interesting and satisfactory. In selecting a site for the fish-hatchery and biological station prior to 1904, a strong reason advanced for choosing Otago Harbour was that owing to the occurrence of a north-easterly current along the coast anything set free in the ocean there would almost certainly tend to go up the coast in a northerly direction. This drift-bottle experiment has shown the accuracy of the forecast. It is not intended to carry this experiment further.

*Research Student.*—The Government having authorized the appointment of a research student to carry on biological work at the hatchery, candidates were invited early in the year to apply for the position. Mr. Maxwell Young, of Wellington, and lately of the Cawthron Institute, was selected for the post, and entered on his duties in June last. Mr. Young brings enthusiastic interest to his work, and has made a very satisfactory start.

*Material for Biological Research.*—The Board, recognizing that university and other workers require from time to time well-prepared material for their biological studies, is preparing a list of the animals which they can supply through their biologist, and this will be printed and distributed. Such material, carefully preserved, will be a boon to all biological professors and teachers.

The other work of the station is thus recorded by Mr. Adams in his report to the Board :—

"The record which was being taken of the rate of growth of the sole, flounder, tarakihi, and wrasse was discontinued during the latter part of June. Owing to a break in the suction-pipe connected to the oil-engine, the reservoir could not be refilled until repairs were completed. There was no wind during the four days that the engine was out of commission, and consequently the windmill was also out of action. We were only able to keep a supply of water running in the turbot-tank, so the flow in the other tanks was stopped and the fish placed in one of the outside ponds. The weather was extremely cold at the time, and the sudden change of temperature killed the majority of the fish, only a trumpeter and a kelp-fish surviving. We are collecting another stock of small fish, and the record of their growth will be again started.

"Stormy and unsettled weather was experienced during the last four months of the year, when off-shore fishing operations were greatly interrupted. Some of the local fishermen stated that the season has been the worst experienced for some years past. When the work of the station and the weather permitted we spent as much time as possible in trawling and line fishing. The stomach-contents of all fish caught were noted. All small specimens taken in the small-mesh net in the cod-end of the trawl were secured by Mr. Young.

"Mr. Bradley has paid a visit to the Dunedin fish-market at least once every week, and the outlying fishing-ports twice during the year. The quantity and prices of fish sold on the market during his visits were recorded.

"The station, which is always open to the public, was visited by a large number of people; during the summer months the tanks contain a number of local fishes, and are of great interest to visitors."

The collection of tow-netting material from the tidal water flowing past the station is regularly carried on, and an attempt is now being made to work out some at least of this large mass of material. It is hoped that some of the sorted-out material may be worked out by specialists in certain lines.