

Worms in pint and half-pint tins, and squid and shelled mussels in small boxes, were frozen and kept in cold storage to serve as food during the voyage. The worms turned out, from some cause or other, to be little better than a mass of slime, and were altogether useless for food purposes. The turbot did not take very well to the mussels, but an excellent substitute was found in minced hake, and this with a little minced squid formed their food throughout the voyage. None were seen to eat for the first five days. They were fed daily, with an occasional day's starving. At feeding-time during the voyage it was necessary to remove the tank-lid and to hold a portable electric light over the tanks. The turbot seized the food whilst descending through the water; any particles that were not thus seized remained on the bottom of the tank until cleared out. Such was not the case previous to shipment, and is not the case at present whilst receiving natural light, and I think this peculiarity must be attributed to a great extent to the effects of the electric light. All unconsumed particles of food, castings, and sand were removed by siphon immediately after feeding, and a light sprinkling of sand was strewn over the bottom of the tank. One hundred died during the voyage, the death-rate thus averaging about two per day. The majority of those that died showed distinct signs of bruises, mostly on the under side. A great many had eaten nothing for many days; the intestines were quite empty, and the whole abdominal cavity was much distended and full of a semi-transparent fluid; the anus in most cases was inflamed.

The three tanks were placed fore and aft in the vessel, each tank received a separate supply of water, but as all were connected and the outlet for all was in the after end of the after tank, the second tank received double and the third tank treble the amount of water that it was possible to supply to the first tank. During the hottest part of the voyage the mortality in the first tank was much greater than in the other two, and when the fish were counted out on arrival it was found that about fifty had died in the first, thirty in the second, and only twenty in the third tank. The aeration of the supply-water was very greatly increased by allowing a fall of about 3 ft. Half-inch glass tubing, drawn out to a needle point and broken off to allow of any desired flow, was secured into the end of the rubber hose leading into each tank, and this, with the cocks left full open, allowed the water to be forced through with the full pressure of the main pumps and to carry a great quantity of oxygen with it.

Up to the date of writing (19th April) only two deaths have occurred since their arrival seven weeks ago, and these two died the day after arrival. They are still being kept in the glass tanks, but at their present rate of growth it will soon be necessary either to liberate a number or to place them in one of the large ponds. Many of them have already attained a length of $5\frac{1}{2}$ in. and are proportionately thicker. They are fed entirely on minced fish, chiefly ling.

Herring-ova.

The herring-fishing at Plymouth is very uncertain. On examining the statistics for the last eight years it was found that, as a rule, few herrings were taken during November, but that the greatest quantities were caught in December and early in January. This season's herring-fishing has been a failure throughout owing to the scarcity of herrings.

Dr. Williamson and I journeyed to Plymouth on Sunday, 5th January. Mr. T. Dance, agent for Messrs. Peacock and Co., of Lowestoft (to whom I had previously written), has most kindly made all arrangements for us to accompany the steam drifters. About eight thousand ova were secured the following night on board a steam drifter. On account of heavy weather this was the only vessel to proceed to sea that day, and none were able to do so until Friday, the 10th January. During the week every effort was made to secure ripe herrings within the harbour by means of set-nets, drift-nets, and seine nets, but no ripe herrings were taken. The weather moderated a little on Friday, and the masters of the steam drifters were persuaded to endeavour to bring in a number of live herrings in their large net-tanning casks. A large number of ripe herrings were brought in by the various vessels, and from these Dr. Williamson was enabled to secure the full consignment of sixty thousand ova. Immediately afterwards the weather became worse, and but for this brief lull no ova could have been secured.

The herring-egg is, roughly, about $\frac{1}{8}$ in. in diameter, and is adhesive. A quantity of milt was expressed from a male and allowed to mix with the water, and the ova were stripped from the herrings in the usual manner (the herring being held under water) on to twenty-four glass plates, each measuring 9 in. by 7 in. These plates were placed in boxes at the aquarium, and the circulating water was cooled by means of a grill improvised out of half-inch iron piping and rubber hose, upon which rested a large cake of ice. They were brought off to the vessel in the shelved boxes that had been made for this purpose, the temperature of the water being about 39° F. The accompanying tables show the maximum, minimum, and average daily temperatures throughout the voyage.

On account of the varying ocean temperatures, but more so on account of the varying pressure of the pumps, it was necessary to keep a constant watch on the coolers, and the ova were rarely left unattended, and never for more than half an hour. A description of the coolers will be found under that heading. All piping between the supply-tank and the coolers was of black iron. The water was led from the bottom of the cooler to the filters by 1 in. rubber hose, and connected up by means of ordinary brass couplings. The filter-boxes were made of $1\frac{1}{2}$ in. yellow-pine, with watertight lids easily removed. These and all other boxes and tanks were painted with bitumastic solution. The water entered at the bottom of the filter and passed upwards through three trays of thick flannel, and was led by two brass taps and $\frac{1}{2}$ in. rubber hoses into the first and fourth compartments of the ova-boxes. A second filter was cleared out in readiness, and the charging of the filters did not occupy more than a few minutes.

At times, such as when on one or two occasions the supply-tank had run empty, or whilst in port, an enormous amount of both fine and solid matter was found on the flannels and on the bottom of the filters, and even whilst at sea about a teacupful of matter could be scraped off