

it were, "in one basket," four of the earliest spawners were removed to the indoor tanks. In order not to injure the attached eggs, the adults were captured by placing a kerosene-tin in front of the shelter, and removing the wooden cover. The lobster soon retreats into the darkness of the tin, which is carefully tipped up and transferred to the glass tank. The process is then reversed, the tin being lowered in front of a wooden shelter in the tank, and slowly tipped up. The slightest movement of the abdomen was thus avoided, and not an egg became detached. The eggs were by this time five months spawned, and an examination of one revealed the gratifying fact that considerable development had taken place. The eggs were remarkably clean, and free from any growth. The bulk of the egg was still composed of greenish-black yolk, but the rudimentary limbs could easily be made out, the eyes were well defined, and the pulsations of the embryonic heart could be seen. Slight bright-red pigmentation was visible over various parts of the limbs, and was particularly noticeable on the telson, which was folded and extended slightly over the rostrum and hid it from view. Drawings of the eggs were made at this stage and at intervals between this and hatching, but, owing to their opacity and the difficulty of tracing the various limbs, these drawings are useless for the purpose of this report, but will no doubt be valuable in future in determining the age of any eggs about which a doubt may exist. The water in the glass tanks was kept slightly warmer than that of the pond for a few weeks, but an accident to the heating apparatus put a stop to this being kept up. The water having become slightly warmer by September, two of these adults were returned to the pond, and the remaining two were kept under the closest observation in separate tanks, each measuring 5 ft. by 5 ft. by 2 ft. 6 in. deep, until in one case all the eggs were hatched, and in the other a number had commenced to hatch out. A wooden shelter was provided for each. These shelters were so constructed that only the two sides rested on the clean concrete floor of the tank. Every particle of unconsumed food, sediment, or detached eggs could be forced out daily by a piece of hose connected with a cock and fitted with a glass tube at the end being inserted in a hole in the roof of the shelter, and the water turned on for a few minutes. Wherever the experiment has been attempted it has been found that, if egg-bearing lobsters are placed in small aquarium-tanks for any considerable length of time, the loss of eggs is far greater than when they are allowed the greater freedom of the ponds. It was necessary, however, to ascertain when it would be advisable to transfer the other seven spawners to the tanks, and these two were therefore retained in the tanks as a guide in this direction, and at the same time a most determined effort was made to reduce the possibility of the loss of eggs to a minimum, and if possible to discover the cause of this loss. Very few eggs became detached during the first month's confinement—one lobster had lost twenty-three in thirty-five days and the other eighteen. The eggs were by this time six months spawned. By the middle of September the loss of eggs had amounted to about one per day, being ninety-four in ninety days and sixty-four in sixty-seven days respectively, the eggs being now seven months spawned. The loss of eggs gradually increased as development proceeded, the average daily loss during the eighth month being eight per day in one case and only one per day in the other. By the 1st November one had shed 630 eggs in 143 days; the other had shed only 228 in 120 days. The eggs were now spawned a little over nine months, and some had already commenced to hatch out. From this time until hatching was completed large numbers of eggs became detached, the total being 2,082 in one case during a period of close confinement extending over 169 days, and in the other 1,637 eggs were lost in 147 days; and of these 1,559 in one case and 1,430 in the other were shed during the last month of fosterage. The first larvæ appeared on the 13th October, and numbers were liberated daily in various parts of the bay from this date until the 1st December. The total number liberated from the first-mentioned lobster was 3,952. No attempt was made to rear the larvæ: they were liberated when from one to four days old, and none had undergone their first moult. The other seven lobsters that spawned during February were left throughout this time in the No. 3 pond (see photo), and had never been disturbed or handled, but the pond had been kept as clean as possible under the circumstances. Weeds, remains of fish, food, &c., were removed daily when the pond was run down, and the lobsters were allowed to remain in as wild a state as possible. This pond was required by the beginning of December to accommodate the last shipment of fourteen females for spawning purposes, as, most of them having already moulted, it was considered advisable to transfer them to this, the only suitable pond, before the eggs were produced. They were therefore removed to the glass tanks on 1st December, 1908. This was the first time they had been handled since spawning in February—nine months. Two of them had lost about three-parts of the batch, two had lost about one-half, the other three still retained practically the entire batch. All the eggs were within a week or two from hatching. The supply-tank had by this time become very foul, the engine and pump were in need of an overhaul, the launch and engine, boat, screens, valve-rubbers, and in fact the whole plant was in need of a thorough overhaul after the compulsory neglect during the previous twelve months, and it was with great regret that the experiment had to be abandoned at this stage, and could not be proceeded with until the hatching of the last larvæ. It was, however, decided to place the egg-bearing adults in their permanent pond, No. 2, rather than to risk the increased loss of eggs that would have occurred had they been kept in the supply-tank water. They were accordingly transferred to this pond the same day. The larvæ would, of course, escape from this pond daily when the valve was lifted and become scattered by the currents; but we are, unfortunately, almost completely in the dark as to the numbers that were actually hatched from these seven lobsters. The average number of eggs carried by each of the nine lobsters when first spawned would be about 15,000, making a total of 135,000 eggs. Although several of those transferred to the No. 2 pond still carried almost a full bunch, these were the most backward eggs, and, as the loss is greatest during the last few weeks, the probability is that these would lose a large percentage before hatching was completed, and I do not think that the average number hatched by each may be estimated at more than the number produced by the one kept in the glass tank until the last egg was hatched—namely, about 4,000. This would mean that some 36,000 larvæ were produced, and about 100,000 eggs were lost.