

were not hatched, the crayfish had destroyed all the eggs. I took up every pebble without finding a single one." Although the eggs appear to hatch in about a week or ten days, the transparent and delicate fry are guarded for many weeks. This period of protection lasts from one to two months.

The experiment has been tried of removing the eggs from the nest and artificially rearing the fry, but the difficulty of aeration, as already pointed out, is great, and many eggs are lost from fungus and non-aeration.

The only really feasible modes of black bass propagation by artificial means are the simple methods of (1) transferring adult parent fish, (2) half-grown fish, or (3) small fry after the period of parental protection is over.

Of the transportation and planting of full-grown fish, it is not necessary to say much. Success has attended the transplantation where it has been tried, and the well-known experiments of the Marquis of Exeter, Mr. Alexander Begg, of Victoria, B.C., of Mr. Max von dem Berne, of Bernauchen, and others, have shown that good results can be ensured by such attempts. In Mr. von dem Berne's experiments only three fish survived out of a considerable number, but they produced eggs which yielded, after the male had fertilized them, broods of young, no less than 1,300 in total number. The number of eggs yielded by a single female varies from 2,000 to 10,000.

I quote, from the narrative of Mr. Silk, the details of the Marquis of Exeter's shipment of black bass across the Atlantic:—

"All of the black bass that I brought in 1878 from the United States of America were taken from the Delaware River. I placed them in boxes floating in the stream ready to be taken away. On the day preceding the sailing of the steamer for England they were placed in the tanks I had prepared for them by the river side. We got them to the train without any loss, and on arriving in New York had them placed on the main deck of the steamer; it was then 11 p.m., we having left the Delaware River at 3 p.m. Up to this time I had no loss; my greatest trouble was the high temperature it stood at—78 deg. all night. I kept the water as cool as possible with ice. I stayed by the tanks all night pumping air every few minutes, and keeping people from meddling with them. When daylight came I examined the tanks and found five dead fish, which I removed at once. It was now 5 a.m., and the ship was to sail at 6 a.m. I got some men to assist me in changing the water in the tanks. I had one spare tank, which I filled first, then reduced the temperature from 75 deg. as it came out of the hydrant to 58 deg., then placed the bass in it, and so on until I had given them all fresh water. We sailed at 6 a.m. sharp. When we got out to sea a few miles, I made arrangements with two of the steerage passengers to assist me on the voyage. It was then 9 a.m. I gave them both instructions what to do. After this I arranged with my men to keep watch two hours each, and to relieve each other at meal times. I always took four hours' watch in the night. I then roused one of the men and gave over the fish in good order. If there were any dead I always took them out at once. I made it a point never to go to my cabin at night. We got on very well the first day, as it was cooler, but after this we got into the Gulf Stream; both the air and sea were very hot, the atmosphere 85 deg., and the water in the sea 78 deg. It was during these five days we lost the most fish. We cleared the water every day by straining it through flannel, all thick and dirty water we threw away and added some fresh water made by melting ice. The sixth day out we got into cooler weather, and the fish commenced to do better. The temperature of the atmosphere dropped to 57 deg. We used very little ice unless to make fresh water with. We kept on like this until we reached Liverpool, after ten days' passage. I now got fresh water and changed all the tanks. The fish did not object in the least, but were quite lively. It did not hurt them changing the water from American to British. I got them conveyed to the railway station and placed on a truck. We arrived in Stamford in due course, and on counting the fish I found we had 153. I left the Delaware with 250, so that I had lost 97 fish in twelve days.

In 1879 I went again, and started from America with 1,200 black bass, and on arriving home I had 812, having done better than I did on the previous occasion.