

and a month later as much as five inches in length. Brook trout in the fourth month are usually two inches from tip to tip, three inches when nine or ten months old, and five inches when a year old. Lake trout (*Salvelinus namaycush*) are six inches long at the end of twelve months, and black bass are four to six inches. The growth of very few marine larval fishes has been observed, but it is interesting to note that in a batch of young wolf-fish (*Anarrhichas lupus*), a fish reaching a length of five or six feet, the larval forms were a fraction over a quarter of an inch long on hatching out, in the fourteenth week (3½ months) they were not more than half an inch in length, this slow growth being probably due to confinement in tanks.

Marine fish being as a rule of very minute size and delicate in organization when hatched probably reach the same length as fresh water species in a much more extended period of time. The observed variation, which is frequently so very great in young fishes of precisely the same age, is of moment in connection with this question of young fry versus fingerlings. Certain fishes moreover exhibit a cannibalistic habit at a very early stage. Black bass when very young, devour each other, even when little over an inch in length, so that it is necessary to take special steps to prevent this. I have on a previous occasion (Rep. Canadian Lobster Commission, 1898) pointed out, in the case of the lobster, that amongst young lobster fry 'cannibalism is frequent, and the method adopted of attacking each other is very striking, as the young lobster barely a few weeks old invariably selects the most vulnerable point, viz., the opening behind the head-shield. The stronger larva springs upon the back of the weaker and savagely bites him at the point named.' Frank Buckland describes the voracity of fingerling salmon and trout and said 'they will certainly eat the young grayling when they can catch them, for they are very active: they also eat young perch. I have placed perch spawn in their tanks, and as the perch, which are exceedingly minute, hatch out, they are caught up and devoured in an instant.'

Whatever arguments may be urged for or against the prevailing system of planting newly hatched fry, it can hardly be doubted by any fair-minded critic that the attempt to stock depleted waters with countless millions of young fish, as is done in Canada, must have some beneficial results. There is certainly much evidence in favour of the view that benefit has resulted. Would better results follow the adoption of the system of planting advanced fry or fingerlings? There are certain points urged against planting very young fry which merit some attention. Nothing, it is said, can be more helpless and defenceless than young fish immediately on hatching out. They must be at the mercy of numberless enemies. This objection has this defect that as a matter of fact most of the fry are some days, or at any rate some hours old when deposited in the open waters. The planting is postponed until at large quantity have liberated themselves from the egg, some time is occupied in removing them from the tanks, carting them to the railway or conveying them by wagon to the more or less distant localities to be stocked. In other words the youngest fry are always 12 to 48 or 72 hours old and are not 'newly born' young fish when placed in lakes or rivers. Two or three weeks elapse before all are planted, and the fry are thus getting older as each batch is sent off day after day during the distribution. Hence the majority of artificially hatched fry are really much older, and must be more sturdy and robust, than the delicate young fish exposed on the natural spawning beds. The further objection that artificially hatched fry are suddenly transferred from warmer water in the hatchery tanks to the colder water of the lake or stream outside is also baseless. The ample supply of water pouring through the hatchery troughs has been found to be, as a rule, many degrees colder than the water to be stocked. Ice is always used in keeping the water cold when transporting the young fish in large tanks. Records have been kept showing that the water in the hatcheries is more equable and cool at the distributing time than in the waters outside. The helpless fry, it has also been urged, being hatched under unnatural conditions are untaught to seek shelter, and must be devoured by watchful enemies. It should be remembered that the eggs are taken from wild parent fish. The fry hatched from these cannot fail to inherit, by the inflexible law of heredity, the instincts of their parents. They act, as indeed they cannot avoid acting, precisely as the young of wild fish do. Hence, when the fry have been carefully watched at the time of planting, they