perature of 48° to 60°. Actual tests on spawning beds have shown that for long periods the water may not rise above 34° or 35° until April, and the period of hatching is therefore protonged to 150 or 160 days, with the result that the fry are

and i can fewe Scotl

in fis

the | inche lift i

of gr

cans the l

other

succe

the p

the b

mom clear

no pl

by a

cause

watch

mean from

device water

in blo

with killin

mouth A " Fry .....tl

01'088

sibly I

their

also

is not 0 large.

as is t In fac

motion

wave t

oxyge T

very in It

can of

before

are to in whi

T

It planted hand, s be mad

It The fi

stronger and more healthy.

In accordance with the conditions which obtain in nature, the fry, after exclusion from the egg, should not be subjected to very low temperatures, but water ranging from 45° to 55° is most suitable. The carrying of fry to the localities where they are to be deposited is an important matter. Railway journeys, if not too protracted, do little harm to fry, unless the cans or tanks holding them are kept too near a stove or hot coils. Excessive heat often proves fatal in railway cars, but as a rule, journeys by rail are less perilous than by team over rough roads, when the shocks and collisions seriously disarrange the delicate organization of the young fry, and damage it is believed the sensitive otocysts of the little fish. Team drives over rough trails through forests are not conducive to the well-being of fry, and when possible, cans should be carried, in the matter described later, over very rocky or uneven tracts. Conveyance by boat or cance is by far the best mode. Cans specially contrived for the purpose are best, and should be made of heavy galvanized iron\* or stout iron well tinned, and holding 10 to 12 gallons of water. They may be 24 or 26 inches high, and say 18 inches in diameter, but may be of the form of a truncated cone, with a narrow neck in the centre for the nurpose of preventing the splashing and loss of water as tar as possible. Into the neck (say 6 inches in diameter), a cylindrical can fits, the bottom of which is made of fine metal gauze. The gauze not only allows of æraticn, but when necessary serves as a receptacle for pieces of ice, which, melting, trickles into the water below in which the fish are swimming about. The ice is often broken up into fine pieces or crushed, if it does not melt and cool the water properly. It should always be remembered that the young of fishes, above all salmonoid fishes, cannot endure heat, nor are they able to withstand frost with impunity. Indeed, ice placed in the lid of the can or tank has proved harmful when on warm days the fry have been surrounded for some hours by water of 50° or 60°. Hence the advisability of transporting young fish either in the early spring months or during the night, and at early morning when the season is warmer and more advanced. At such times they can be most safely shipped.

It is well known that newly hatched fish are far less hardy than eggs. But even eggs during the first few weeks are very sensitive, and within three weeks after fertilization they should be subjected as little as possible to concussions and rough usage. Salmon eggs 22 days old died in 8 or 9 days after being roughly handled during some experiments by the late Dr. Francis Day, the well known British salmon authority, but after the 47th day only very hurtful causes, such as chemical impurities, &c., will do them any harm, and "eyed" eggs are hardy in the extreme. No doubt vast numbers of ova are lost every year at the head waters of salmon rivers by being frozen. Certainly in 1881 this loss was very severe on many Scottish The famous physiologist, Dr. Davy, brother of Sir Humphrey Davy, imbedded salmon eggs in ice, and found that they survived; but his experiments provided conditions probably more gradual than the severe and trying circumstances

of freezing near the source of a river. In order to keep the cans suitably cool an outside jacket of iron is often provided, separated by an empty space from the inside can containing the fry. Such double cans are very effective, and being much cooler than ordinary cans the fry are shipped in them with much greater safety and success. Whitefish fry which are very small and delicate will to the number of 15,000 to 25,000, travel in one of these cans without loss if the journey be not long and trying; but half that quantity of brook trout and salmon would as a rule suffice. Some authorities favour the wise principle of putting a minimum quantity of fry in each can and regard 3,000 to 5,000 as ample, but with newly hatched fry before the gills are properly developed,

<sup>\*</sup> While galvanized iron is the best material, it must be remembered that the spirits of salt, used in soldering is very hurtful, and new cans, should stand full of water (often renewed) for eight or nine