Re: Transportation Experiments

INSTITUTE FOR FISHERIES RESEARCH
UNIVERSITY MUSEUMS
UNIVERSITY OF MICHIGAN
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MAXIMUM AIR REQUIRED IN TRANSPORTING FISH, WITH REMARKS ON ACCESSORY EQUIPMENT

In response to request of chairman W. H. Loutit, we wish to report on maximum air needed per gallon per minute in transporting fish. And we take this opportunity of making some suggestions on the equipment needed if compressed air be decided on as an aid in transporting fish.

A minimum-sufficient figure ought also be given, but to obtain that would require a long experimental study on trout, would involve a consideration of type of container, number of fish carried in each, kind of water, length of haul, etc. At some future time we hope to be able to give accurate figures on the minimum amount of air needed to keep trout under given conditions. At present our equipment for holding and experimenting on trout is not completed (but we are laying plans to have this equipment ready soon).

For a maximum figure of air needed we have relied on our general experience, and a simple test. Taking a 5 gallon can, which is as small as or smaller than any likely to be used in transporting fish, we put into it such a supply of air from a compressed air system as would according to our general experience more than suffice to keep the water aerated with an overcrowding of fish. We put in as much air as would give the maximum number of bubbles, using a 5/8" "filtros plug", which is a device to break up the air current into small bubbles, and which should always be used. Any greater amount of air causes the bubbles to coalesce, and reduces the surface contact between air and

water. We have found such an air supply sufficient for many warm water fish in a 14 gallon aquarium. Granting that trout would need more, we still ought to have a big margin of safety in planning that much air for a 5 gallon can or twice as much for a 10 gallon can.

By trapping the air thus released into the 5 gallon can, we found the flow to be just 1 1/2 quarts of air per minute, per gallon of water.

This figure is no doubt well in excess of any ordinary demand, and would serve in an emergency, as when the fish were showing distress, or when an overload of cans or fish was being carried. No doubt 1/2 quart of air per minute per gallon of water would give as good aeration as is effected by one or two men aerating the water by the usual dipper-pouring method—especially since the compressed air would operate continuously in all cans.

If a tank is being considered rather than the usual cans, even then a considerable number of outlets should be provided for, so as to have that many columns of air passing up through the tank. One length of 1/2" pipe with the needed number of 3/8" hose-nipple outlets should be planned for, whether cans or tank be used. Rubber hose of proper size with a filtros plug at the outlet end, would serve to connect the hose-nipples with the individual cans or with the bottom of the tank.

It would be quite feasable to plan a convertible truck, on which a demountable tank could be installed, or which would carry the usual cans for local distribution, or which could be used at other times for other Departmental purposes.

To power the air compressor, if such a system be decided upon, we would suggest looking into the possibility of using either a double-sized storage battery, or two batteries.

INSTITUTE FOR FISHERIES RESEARCH

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Director

Copy to W. H. Loutit
" " F. A. Westerman