



Fish Must Have Air

FISH cannot live without air. Well, not exactly air, perhaps; but fish must have the same air-element that we ourselves must have, or perish. Oxygen is as necessary to them as it is to us, and for the same reason: to be carried to all the living cells by the red blood corpuscles, and there to burn up the fuel-foods that keep the life-fires going.

We get our oxygen from the air we take into our lungs. It is the only chemical element we extract from the mixture we call air. The rest—nitrogen, carbon dioxide, and the rare gases argon, krypton, neon and xenon—play much the same role in our breathing that “roughage” does in our eating. They just dilute the oxygen, which in the pure state might be a bit too concentrated.

For the fishes, oxygen is dissolved in the water, instead of being mixed with a lot of other gases in the air. The endless water-gulping of fishes is simply their means of keeping a steady stream of water flowing over their lungs, so that they may extract the necessary oxygen from it. The old simile, “drinking like a fish,” is therefore a libel on the fish.

If there is no dissolved oxygen in the water the fish cannot live. The principal reason why there are no fish in excessively polluted rivers is not that the fish object to the filth (though many of them do), but that the innumerable bacteria and other lower life-forms take out so much of the dissolved oxygen that the fish never get a chance at it.

You get the same sort of thing on a small scale if you don't change the water in your goldfish-bowl often enough. The fish use up a considerable part of the dissolved oxygen themselves, and

the micro-organisms multiply, using up the rest. So your fish get into distress. The situation may be considerably aggravated if you let your goldfish-bowl stand in a window or other warm place, for warm water will hold less oxygen in solution than cold.

Some fish can live for considerable periods out of water, but they are not getting much benefit from the air—if any at all. Fish gills are not adapted for getting oxygen out of air, any more than lungs are adapted for getting oxygen out of water. When a catfish lives for a half-hour lying on the bank in the sun, it is simply a phenomenal case of “holding his breath.”

There are also fish that deliberately leave the water and migrate for considerable distances overland. Such fish usually have tight-closing pockets over their gills, that retain a small supply of water, and so prevent them from drying out. They also get along by “holding their breath,” just as a good diver can work or do stunts under water for several minutes before he has to come up and breathe.

There are, of course, fish that do breathe air—the famous though now rather rare lungfishes of the tropics. They have real, though rather simply constructed lungs.

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