

With this object in view, a perch (*Perca Americana*, Jordan) was placed in 600 c.c. water in a jar, and arranged so that a continuous stream of air was bubbled through it. There was just enough water to cover the fish. Its position in the bottle tended to throw the animal on one side, in which position it seemed to stiffen, for at the end of 24 hours it was removed from its prison with its body slightly curved to one side. In 3 or 4 hours it could swim slowly about the aquarium, but for days afterwards it had a kink in its tail. This experiment shewed that unit mass of fish lived in unit volume of aerated water for 130 minutes.

In another experiment of a similar kind a small rock bass lived for 74 hours in 700 c.c. of aerated water.

#### RATE OF RESPIRATION.

A few observations were made upon the rate of respiration in fish confined in an aquarium. Four rock bass breathed at the rate of 44, 48, 52 and 56 per minute in water at 22 °c. Rate of respiration here means the rate at which the gill covers were raised. When the water was cooled down to 5 °c. the rate in one of the animals fell to 16 per second, and when warmed to 32 °c. the rate increased to 112. Warm water (32 °c.) had another peculiar effect on rock bass. It caused the pigment cells (chromatophores) of the skin to spread out and give a decidedly darker hue to the whole fish. This became particularly marked when the animal was returned to the aquarium where it could be compared with the other fish.

Muscular exertion also increased the rate of respiration.

#### EXPERIMENTS WITH SAW-DUST.

A box 3 ft. long, 2 ft. wide and 14 in. deep, lined with zinc, was used as a tank in which to confine the saw-dust and fish. The box was covered with mosquito netting, and over this wire gauze. A pailful of old, that is water-soaked, saw-dust and about a quart of fresh saw-dust were placed in the tank. A V shaped trough conveyed water (from a dam or a very small trout stream) down to the tank. The tank itself was immersed in a small pool, the water of which came up the sides of the tank to within 3 inches of the top. Temp. in shade 16.9 °c, in the sun 11.3 °c.

About two miles up James' brook, from where it empties into Chamcook harbor, near St. Andrew's, N.B., was the site