

June 30th. A slight modification was made in this experiment. In place of siphoning off the strong extract at the bottom of the aquarium, the whole 7,000 c.c. of water were drained off, and the aquarium was filled up with fresh water. The weights were removed from the bag, which at once rose to the top of the water. Consequently the extract coming off from the sawdust, being heavier than the fresh water, fell towards the bottom and became uniformly diffused throughout the vessel. This was the twelfth withdrawal. Black bass fry lived five hours in this water, which was, of course, becoming more poisonous all the time.

July 7th. The last experiment with this sawdust was made to-day. The bag is still floating. The water was changed for the twentieth time at 9 p.m. last evening. At 9 a.m. to-day a black bass fry was immersed in this solution. In two hours it was dead. Some of this solution was evaporated and was found to contain 160 m.gs., or, allowing for the residue after ignition, eighty parts per litre. That is, pine sawdust soaking continuously since June 16th, with the water on it changed twenty times furnished in twelve hours eighty parts per million of poisonous extracts from its wood cells.

Comparing these figures with those for a saturated solution already given, viz., 1,160 parts for 1,000 c.c., we see that there has been a continuous withdrawal of poisonous material from the sawdust. The question, therefore, of determining whether any stream is polluted with pine sawdust or not is largely the question of determining the minimum amount of sawdust extracts which will kill fish eggs, fry, adult fish, and fish food. Needless to say, such determinations would have to be made for every sawmill stream in Canada, and for each separate kind of fish.

OTHER WOOD EXTRACTS.

A number of experiments were made with extracts from other woods besides pine and cedar. Norway, or red pine, British Columbia cedar, maple, hemlock, oak, ash, elm were all used, but it was soon discovered that the most poisonous extracts were obtained from the pines and cedars. Consequently experiments with the hard woods were soon discontinued.

From all hard woods, however, the saturated yellowish-brown extract was found to be very poisonous to both adult fish and fish eggs.

The following experiments give typical results in the case of each of these woods.