

this latter case the poisons come away so slowly that air (oxygen), sunlight, and bacteria have ample time in which to change their poisonous character; whereas in the saw mill, the pulp mill, and the beet sugar factory, the poisons are quickly discharged into running water, and tend at once to produce their effects upon fish and other life.

STRENGTH OF SAWDUST EXTRACTS.

As already explained, the first experiments were made with solutions obtained by soaking white pine sawdust for at least twenty-four hours in tap water from Lake Ontario. When the sawdust was soaked for four days in tap water, 1,000 c.c. of the yellowish-brown solution already described as oozing out from the bag of sawdust, and lying at the bottom of the aquarium, yielded 1,240 milligrams of solid matter after evaporation in a platinum crucible. The ash from this weighed 80 m.gs., which was found to be exactly the same as that from tap water. Deducting this from 1,240, leaves 1,160 m.gs. as the weight of the material stored in the pine cells of the sawdust, and dissolved out in 1,000 c.c. of water in four days.

After filtering off the first water, and adding fresh water to the same sawdust, and allowing the mixture to stand five days longer, it was found that 1,000 c.c. of this second solution yielded a total of 360 m.gs. of solid, or allowing for the ash in tap water, a net residue of 260 m.gs. of reserve material was dissolved out the second time.

The corresponding figures for cedar (Ontario) sawdust were as follows :—

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| 1. Solid from 1,000 c.c. soaking four days..... | 1,300 m.gs. |
| 2. Same sawdust with first water filtered off, fresh water added and allowed to stand five days | = 550 m.gs. |
| 3. Same operations repeated, soaking five days | = 350 m.gs. |

No allowance is made in these figures for the ash from tap water, viz., 80 m.gs.

These figures indicate clearly enough that the reserve material stored in the wood cells comes away in diminishing quantities every time fresh water is added to the sawdust.

The next point sought to be determined was the number of times that fresh water could be added to a fixed weight of sawdust and continue to produce solutions which would be poisonous to fish life. For