

five years. It is obvious that only a small part can be salvaged. Facing this proposition squarely and openly

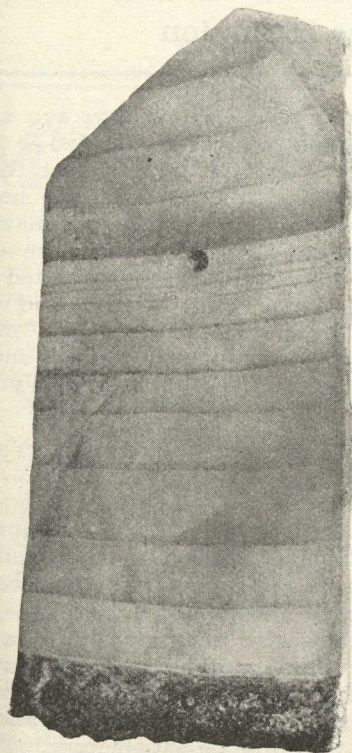


Fig. 2.

every effort should be made to utilize these dead and dying trees before it is economically impossible, and the provincial governments should make every concession possible to encourage the lessees or owners of the limits to accomplish this end. The ground is now covered with a thick stand of balsam reproduction which will insure a future crop. It is growing thriftily since the opening of the stand but mixed with this reproduction is an ever increasing tangled mass of dead tops, accumulating as the rotting trees break off. A fire under such condition will kill everything, destroy the soil and leave a barren waste. Two enormous fires in just such a region were witnessed last summer. There is no doubt that their magnitude and severity were directly due to the dead balsam. Another feature bearing on the salvage of this timber is the reduction of the secondary insects and removal of the weakened trees suitable for their breeding. Thus the more rapidly this timber is salvaged the more economical the cutting will be and the greater the number of green trees saved. The dead balsam stands only 2-4 years.

Combating the Insects

Prevention of the continued dying of these trees consists in reducing the numbers of secondary insects in the forests. The only practical method by which this can be accomplished is by cutting the beetle infested trees, those having red foliage, during the winter and placing them in water before the balsam buds open in the spring. These trees were attacked by the beetles the previous summer. The foliage turns red and forms a very conspicuous object in the forests. If these trees are left standing new broods emerge and attack other green trees.

Beetle control is obviously possible only in situations where a small percentage of the trees are infested or where the attacks are localized. Price Brothers, Limited, have during the past year explored nearly all their limits for budworm injury and classed them according to the percentage of dead trees. On the Shipshaw limits, beetle control operations have just been completed.

These forests consist chiefly of second growth following old fires. They were invaded by the budworm in 1911 and from 10-15 per cent of the balsam destroyed. The greater part of the trees were able to recuperate from the effects of the defoliation and return to normal growth. (Fig. 2). A smaller part recovered

just sufficiently to continue growing (Fig. 3.) and resist the attack of the secondary beetles under normal conditions.

During the winter 1918-19 some seven square miles of this region were

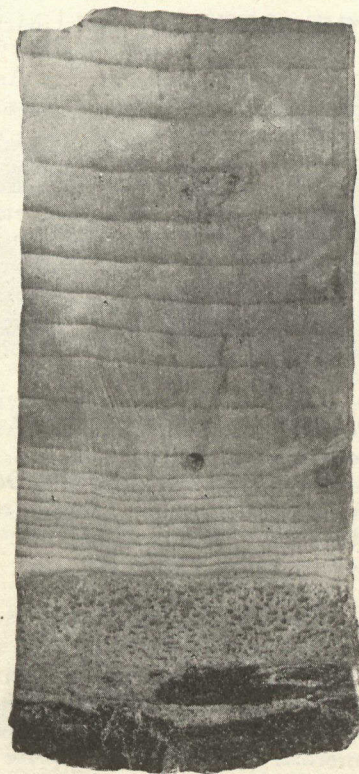


Fig. 3.

logged in a strip on each side of the river, varying in width from $\frac{1}{4}$ to $\frac{3}{4}$ of a mile. No further operations were conducted since. The cutting was very patchy, here and there through the area strips or islands of green timber were left standing, as well as many defective large trees and those trees under the Quebec diameter limit. These scattered trees, subjected to the weakening effects of wind and sun offered an ideal breeding place for the secondary beetles. Two species of these beetles breed only in standing green trees and can successfully attack only those of lowered vitality. A third will breed in slash or practically dead trees and follow up the attack of the others in living trees. The summer following the logging operations many of the scattered trees in this area were attacked and killed, and a large number during 1920 and 1921 so that during the past year the beetles had increased enormously and having killed out practically all the trees left under the diameter limit began invading the islands of green timber and the stand surrounding the logging area. At present this attack rarely extends further back than 300 feet into the green timber.

will help materially. Sooner or later these losses are bound to be seriously felt with consequent increased prices. Higher prices for the products of the forest will permit closer utilization, better logging methods, increased protection and ultimately tend toward alleviating the situation. The best we can hope to do at present is to utilize as much as possible of this dying and dead timber and, where feasible, retard the deadening by control of the secondary bark-beetles. The situation now confronting the lessees or owners of these lands and the governments is the most expedient means of salvaging the dead balsam and spruce and preventing the further dying of the trees.

In one instance estimates show that of 1,500,000 cords of dead or dying timber on one drainage system, only 600,000 cords can be utilized before the stand is too far gone. This is characteristic of many areas in Quebec and New Brunswick. In many localities 50 to 75 per cent of the merchantable balsam is already dead and the remainder rapidly going. These trees will only stand for a few more years. In one locality where salvage operations are being conducted and where figures are available, wood rotting fungi have so reduced the sound wood of the standing trees that 20 per cent of the logs had to be culled. From the fire hazard alone