

still believe that they are yet too theoretical to tackle such problems. We hope that our American and Canadian concerns some day will give a chance to the foresters to direct the operations, which they ought to be able to conduct, at least as well as the men who have graduated from the axe. I have also been highly pleased to hear the great compliments paid by the lumbermen to the professors of the various forestry schools, and the esteem and the praises which they give to their own foresters. I found that the chief forester there was the man who not only looks after the raising of the forest crop, that he is not only asked to make the inventory of the forest and to plant a few trees every year, but that he is also in charge of all the lumbering operations, even of the drive, with the result that he is a real master in his forest and gives better results than when he is limited only to one phase of the operations.

The utilization of the trees aims to be as conservative as practical. The stumps are always very low, not more than half a foot in height, but I have seen cuttings, which were not more than a couple of decades old, where the stumps had two or three feet in height. I have found that if they were removing all that they could from the trees in the accessible regions, even converting the tops into charcoal, in the remote sections of the Norrlands, there were places where tops, measuring six inches in diameter, were left behind, because they could not find any market for these products.

The lumbering is generally done by small jobbers. Very seldom, they employ the Company camp system as done in America.

After the tree has been cut, the limbs are immediately removed, and an expert scaler comes along who indicates by notches the places where they may cut the bole into logs. I believe that this system enables them to get a better class of logs, but it certainly yields more material out of their trees, than our present rigid method of making logs of a fixed length. I may also mention that, as a rule, the forest is kept very clean. That is, we seldom see trees of poor appearance or diseased, or frost cracked, as we do find here, because when they make their operations, instead of leaving the poor trees behind as we do, they remove them so as to maintain the forests in a good state of health, with the result that the future crops will be composed of good and sound trees instead of straggling ones, as

we are exposing ourselves to by the poor selection made.

They have a great advantage over us by the fact that the composition of their forests is very simple; they have practically only two merchantable species, spruce and pine, whereas we have several varieties of pine, of spruce, also balsam, and many other species, all struggling to replace the other, increasing, thereby our problems of regeneration.

Stopping Fires in Sweden

But where the Swedes have us beaten to death, is in their control of forest fires. One can travel for days on one of their railways without noticing on each side of the track any extensive section of burnt over forest, as we do in America and Canada. Everywhere, the forest is green and in a healthy condition. When you travel through their country, you have always before you the same beautiful and refreshing landscape; all the mountains are dotted with green patches, and nowhere can one find large sections covered with charred tree, or blown down trees and bare rocks, as we have here the regret to see over thousands of miles. During my stay, last summer, they suffered from drought as bad as we did, but the country was not covered with the clouds of smoke we had the misfortune of having. Yet they did not seem to fear fire, nor to have formidable organizations as we must resort to, but every man knew what a forest fire meant to his country and with their love for their fatherland, it was not necessary to drag any man by law to fight a fire. Whenever there was a report of a fire, immediately every farmer of the neighbourhood left everything, offering his services to fight the plague, and, if the local ranger found that he was not able to put out the fire with the men that he could dispose of, he would immediately wire to the Governor of the Province (Lan) to get additional help, and a regiment of soldiers or more were soon sent by special train to extinguish the fire. I believe that the Swedes have succeeded by putting out the fire of their forests because everyone of them loves the forest and realizes what the forest means to them, as almost one-half of the export trade of Sweden is formed by forest products. Instead of preventing the people from settling in forest districts, they have taken the problem in their hands, and the lumbermen are helping and directing the settler where he can establish himself, so as to be of help in case of need, and also to work at the removal of the

crop. I believe we should copy these examples, and establish within our forest sections, groups of colonists who will help to prevent and combat fires. We must also have better communications, that is a better road system and a complete telephone system so that in case of danger, help can be summoned quickly, and not days after the start of the fire. Our organizations have achieved great progress, but this is not enough, and you will admit with me that when we think we that have lost, last summer, nearly 1,200 square miles of forests, we must take the means to prevent the repetition of such a calamity.

Replanting

Not satisfied with protecting effectively their forest wealth, the Swedes have realized that it is also necessary to help nature in its work by planting trees where, for one reason or the other, these do not grow quickly enough. Also to prevent devastating cutting of private lands forest commissions were established in each province to control the lumbering operations of private owners, and when it is found that the forest has been cut in such a manner that the reproduction is in danger, then the commission compels the owner to have his land reforested at his expense.

I was also much interested to see the precautions taken to avoid the brushing of logs in the passing of streams and rapids. The Swedes will not hesitate to make a long sluice to float logs where there is danger of their suffering breakage at the ends. Furthermore, they are not afraid of making logs as long as possible, whereas, here, we stick to the small sizes. As the average length of the logs made on the Crown lands here is about twelve feet, we find that the overlength of six inches, which is tolerated, represents as much as five per cent of the total cut. In other words, every year, fifty million feet of good lumber is wasted during the driving operations, because we have not yet devised all the improvements to avoid brushing. I think this forms the interest of a very large sum, which could be used profitably to improve our driving systems.

Driving is done in about the same way as here, but in the lower parts of the rivers, where there are several companies operating the driving, the sorting of the logs is made in common. We have found a very interesting device for the bund-

(Concluded on page 723)