

WOOD PULP ~ DEPARTMENT

PULP WOOD—TREATMENT OF THE RAW MATERIAL IN THE LOG AND ITS MEASUREMENT.

BY A CANADIAN PULPMAKER.

CHAPTER II.—FOREST OPERATIONS.

The utilization of other woods referred to in the previous chapter has arisen chiefly from the scarcity of spruce wood, that is in those districts where, by reason of the extensive lumbering operations, the quality of spruce available is small, or costs too much to get to the mill.

There is no doubt that this scarcity can be attributed to the careless and extravagant manner in which the spruce was handled in the forests in the earlier days of pulpmaking. Of course this is not the only reason, but it is easy to show that the absence of any regulations as to the manner and extent of the operations has done much to exhaust the supply of a valuable source of pulpwood.

Of recent years the necessity of stringent and efficient regulations to prevent the utter destruction of trees and timber growth has been recognized both in the States and in Canada. It must not be forgotten that the conditions upon which the timber lands are held by the firms operating them largely determines the nature of these rules for preservation. In cases where the limits are held in fee simple, and are the absolute property of the holders, the observance of any rules is merely a question of self-interest, and the Government can hardly enforce the carrying out of any regulations laid down. But with Crown lands the preservation of the forests, with a view of maintaining a more or less permanent supply of valuable timber, is now becoming a matter of the utmost importance.

An interesting and useful book dealing with this question has been written by Gifford Pinchot, in which the results of tests and observations on lumbering operations carried on in the Adirondacks have been fully recorded, and certain deductions drawn therefrom as to the most profitable method of operating with the object of ensuring perpetual growth of new timber.

The following extract from his book, "The Adirondack Spruce," well defines the true function of forest management:—

"Under the present system the lumberman practically ignores the fact that forest land is productive capital. He speculates in the timber with little regard to the real productive capacity of the land. He cuts not only the mature timber, but the growing trees as well. In other words he removes, not only the accumulated interest of many years, but with it the most productive portion of the capital. If, however, the ripe timber alone is cut, and enough young trees are left to replace it, the growth of the small trees and of those which germinate under the new conditions will be actual added interest. That is to say, that the unproductive portion of the capital has been converted into money to be invested elsewhere, and the forest has been put into such a condition that its power of growth is utilized."

The practical side of the question is not lost sight of, for Mr. Pinchot goes on to show that careful adherence to certain rules not involving any appreciable expense will go far to keep up the supply. A few of these may be mentioned to indicate their general character. In most cases trees fourteen inches and more in diameter are ready to cut. Smaller trees showing signs of decay, and crooked scrubby trees crowding the young growth, should also be removed. Only such trees as are marked by the superintendent of the operations should be cut, and great care should be exercised while felling trees not to injure the young growth. The trees felled should be cut into logs at once, and not allowed to remain lying across young trees, and

any of the latter bent over by felled trees must be released and straightened out. Care should also be taken to prevent fire, and to guard against conditions likely to cause fire in the branches lopped off the trees.

It may be noticed that regulations of this kind, if consistently carried out, would not involve expense, and, therefore, are practical ones.

In the province of Québec, Canada, the general rule laid down for the lumbering operations in spruce and pulp woods is that no tree shall be cut which does not measure 11 inches on the stump. That is, the diameter of the stump left in the ground after the tree has been removed must measure at least 11 inches. This rule has proved a good one so far, although recently considerable latitude has been shown in this measurement, but at the same time the principle of preventing a wholesale removal of small trees likely to reach maturity in a few years is recognized and acted upon.

In the province of Ontario the regulations are not of stringent nature, with the result that the timber limits are cut to such an extent as to seriously endanger the prospect of aftergrowth.

This neglect of suitable precautions applies more particularly to the lumbering operations in pine timber, which are of much older date than those of pulp wood, the latter, indeed, being of very recent origin. It is obvious that any system which allows all the timber on a given area to be cut and removed without any restrictions as to the size of the trees is fatal to the preservation of the forest. In the early days of pine lumbering the wood was so abundant that the trees which did not measure more than about 10 or 11 inches on the stump were passed over and left alone, so that the abundance of large timber served as a protection for the smaller growth.

Considerable loss of merchantable timber and of wood capable of conversion into pulp wood is sometimes occasioned by the method of cutting all trees into logs of a uniform length. As a general rule the trees after cutting are saw into logs of 12, 14, and 16 feet lengths, but some manufacturers ask for one uniform size, and this causes a loss of a certain proportion of the tree.

In Quebec, for example, logs are often, for the purposes of measurement, referred to the Quebec standard log, which is a log 13 feet long and 14 inches in diameter, and consequently the length of 13 feet has been much employed in lumbering operations. Hence, a tree containing 28 feet of really serviceable timber cut to such an arbitrary length would lose two feet of good material for no purpose, beyond mere compliance with an unnecessary rule. For pulpwood in particular any strict regulation as to length is quite uncalled for, seeing the conditions of manufacture do not require it. The ultimate size of the pulpwood for actual manipulation is a length of two feet, and, therefore, it is best to allow the trees to be cut into lengths of 12, 14, or 16 feet, and in this way the whole of the good timber is available.

It is hardly necessary to say that it is possible to utilize much smaller logs for pulpwood than can be taken out for lumber, so that a large part of every spruce tree is suitable for pulp. The upper portion of the tree is of no value, being of small diameter and full of branches, and the usual practice is to cut off the top at a point where the diameter is about four inches, leaving a long piece of timber to be cut up into proper lengths.

A spruce tree, five inches mean diameter, will give a log 18 feet long after the removal of the upper portion. The mean diameter is the average of the top and bottom measurements of the tree. A tree showing six inches at the top end and 12 inches at the lower end would have a mean diameter of 8 inches.

For other trees we have logs as follows:—

A tree 8 inches diameter should measure 36 feet in length.

A tree 10 inches diameter should measure 48 feet in length, while one of 12 inches diameter will go 60 feet long.

In cutting up these trees it is evident that logs should not be one uniform length, but that they should be cut into logs 12, 14, or 16 feet, according to circumstances.

It is by attention to apparently small matters of the kind hinted at in the above lines that the best results are to be obtained in the operations necessary in the forest for cutting out the pulp wood.

CHAPTER III.—MEASUREMENT.

As with all material which is used for industrial purposes, so in the case of pulp wood the considerations connected with the measurement of the wood after it has been cut down are of great importance. Not only is the buyer or consumer interested as well as the seller and the contractor, but in much of the wood taken out the Government has a direct financial interest. This arises from the fact that a good proportion of the timber cut is obtained from Crown lands, and all wood removed from limits in the possession of the Government is taxed, the purchaser having to pay certain dues on all the timber consumed. In consequence of this direct control of the limits, the rules laid down for the measurement of the wood are somewhat stringent, in order that the full amount of the dues may reach the Government.

In the first place, every contractor taking out wood on lands owned by the Crown is obliged to employ the services of a licensed scaler or scaler. No person is allowed to act as a scaler or measurer of logs unless he holds a certificate from the Government, stating that he possesses the proper qualifications and requisite knowledge as to the duties appertaining to such an important office. The penalties attaching to misconduct or fraud on the part of the scaler, and to any attempt to defraud the Crown of dues by wrongful returns of the wood cut, are pretty severe, so that the regulations in respect of the measurement are generally followed closely. Wood rangers or inspectors, acting solely under instructions from the Crown Lands Department, visit the several camps in which timber operations are going on, having all necessary authority to see and examine the returns kept by the scaler. In Canada this control of the operations is fairly complete, not only as regards pulp wood, but also in respect of pine cut for lumber and other woods removed from Crown lands.

With one exception the almost universal rule which obtains for the measurement of logs is that each log as it is cut down is measured at the small end. This exception will be dealt with later. By measuring the small end it should be mentioned that every log is slightly conical in shape, this being due to the natural taper of the tree, and a record of the diameter at this end is made by the scaler. A note is also made as to the length of the log. In all the measurements allowances have to be made for imperfections in the tree, and it is in this respect that the scaler has to exercise his judgment. If a log, for instance, is 16 feet long when cut and appears to be rotten at one end, the scaler may deduct a certain amount from the length according to the apparent extent of the rot. Should he judge that the rot extends two feet into the log then he would record the log as being 14 feet long instead of 16. The diameter is usually taken inside the bark, since the bark itself has no commercial value, and it is therefore only right to deduct the thickness from the actual diameter of the tree. Another method adopted in making allowances for imperfections, or "cullings," as it is generally called, is to reduce the diameter, more particularly in the case of crooked logs, so that a log measuring nine inches at the small end may be culled down to an eight-inch log. It is thus evident that the duty of scaling is a very important one to all parties concerned.

The measurement taken, namely, the diameter at the small end of the log and its length, form the basis of subsequent calculations which give the contents of the whole of the timber cut in terms of certain well-defined units. The exception referred to above is a more complicated method introduced by the Ontario Government in the measurement of pulp wood as follows: