

THE MANAGEMENT OF PULP WOOD FORESTS.*

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I have received here the programme of your meeting, and note that you have put my name down on it. It is, therefore, with more than the strong regret I feel at the loss involved to myself, that I have to tell you I cannot attend. Neither have I opportunity to write an extended paper. The best I can do is to tell you very briefly of the methods of control of lands and logging practised by the concern by which I am employed, and indicate what has been our experience in the way of conservative cutting.

But first I wish to put you and any others who may have control of spruce woods on your guard against a beetle which destroys spruce timber by boring round in the inner bark of the trees, thus girdling them. It is this insect, apparently, which has destroyed large quantities of spruce timber in Maine and New Hampshire at different times in the last thirty years. It is now doing considerable damage in the Androscoggin Basin and on neighbouring land in both states, and I have myself traced it at different points across the boundary into Canada. This beetle, *Dendroctonus* by name, has been under observation in our forests for the last four years, and it has also been studied by an expert entomologist. From all we can learn it is by far the most formidable enemy that spruce has to dread in this country. Formidable it certainly is here. In my opinion it has destroyed half a million dollars worth of stumpage in the last ten years. You may have observed it in Canada. If not, I feel sure that its ravages have been overlooked and that careful examination of your land will disclose it. I will not say more of this matter, but will refer those interested to the literature sent and particularly to the box of specimens shipped you by express from Rangeley.

As for conservative cutting of spruce woods, I will say first and most emphatically that it is a difficult and ticklish process, one that is likely to bring more loss than gain unless done with great care and considerable skill. It may be different in other countries, but that is the case here. Our timber is typically large and tall; much of it stands in exposed situations, on ridges and mountains; much is on extremely rocky lands. The winds are continually damaging our native uncut stands, and the thinning of woods in all such places as above is either entirely impracticable or must be done with the greatest caution to ensure what is left standing will not blow down.

As already said, the danger from the wind might be much less in another country. In this very region, indeed, considerable light cutting was done in decades past without incurring great proportional loss. That, however, was different work from what is required now.

Not more than a third or half the timber was taken then and that in bunches, the biggest and best, leaving thin strips and the difficult and steep places entirely alone. At the present time business conditions are different. A stick of spruce or fir scaling only 20 feet B. M. is merchantable, and has stumpage value if it is not too far away from other stuff. We are logging a good deal of rough, difficult lands with frequently a long and costly road built into it, requiring a heavy cut to pay the bills. At any rate, owners through this region expect that on any land logged over three-quarters of the stand shall be taken, and to take out three-quarters of the timber from most of the lands we have to handle, leaving the balance safe to grow and reproduce, is as I have indicated above, a very ticklish matter.

My experience in the actual handling of spruce lands covers four years. According to my observation, a logging boss trained to hard cutting when told that we wish to cut conservatively, is pretty sure to leave what he does leave not in the shape of small growth so much as in strips of scattering timber and odd corners on rough and difficult ground. This makes the logging show up cheaper, but it may be, on the other hand, that what is left standing is the very stuff that most needs cutting off. In other words, as a first result, instead of thinning or conservative cutting, we are apt to get simply slack cutting.

When this has been corrected and the man gets a better notion of what we are about, his next move is to

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leave the small growth uniformly all over the land. This may do in some countries, but it means loss here. Tall and slender trees left too open, anything less than a full stand, on divides and knolls, tall timber shoally rooted on rocky land—these items together may amount to a good deal in a logging job, and all of them are such that sooner or later they are sure to blow down.

Our day of reckoning came in December, 1900. Two gales came that month before the ground was frozen, one of them after a soaking rain. The loss suffered was not in cut over lands alone. Some of the down stuff we have picked up since at added expense. Some of it is so scattered that it is impossible to get it. Something of that, however, was to be expected.

We have not been discouraged, but have simply inferred that we must be more careful and exercise closer control of the work. We learned something ourselves by experience, and in course of time came to have a better understanding with the men. For the last two years I think we have been doing fairly well. Considerable merchantable stuff has been left to grow and for the most part I feel pretty confident about it. The key to success is variation of the cutting according to the stand and lay of the land. The critical matter, the thing which must be continually thought about, is the safety of what is left from wind. Mixed growth, that is to say, growth in which hardwoods comprise half or thereabouts of the total stand, can generally be thinned with safety and comparative ease. Elsewhere great care has to be exercised, and there is a great deal in picking strips and bunches to be left entire. This we frequently do with areas of small thrifty growth if there is no dead, failing or down stuff in them. Lastly, we do not hesitate, when we think that is the proper thing to do, to cut clean.

There is one side issue that might be elucidated here, and that is the form of contract under which work of this nature is secured from jobbers. The Berlin Mills Company owns several hundred horses and does its own logging largely, but a portion of its work is done by jobbers cutting by the thousand, and strange as it may seem, these men do their work as well and are fully as amenable to control as the company's own men. They have always cut quite as economically as the others in respect to stumps, tops, picking up windfalls, dead timber, etc., and think we are securing from them now quite as good work in this other line.

The clause in our contracts which covers this feature of the business is as follows: "Spruce and fir timber shall be cut to the size of 12 inches on the stump, but this rule may be varied by the Berlin Mills Company with a view to leaving the land in good growing condition." This form of contract is not recommended as a solution of all difficulties and guarantee of success. It does not replace supervision, but distinctly implies it. Then men might understand its terms differently and get at loggerheads with one another before they had been at work a month. But this form of contract does allow latitude and adaptation to the country, and with two of our concerns the past winter it has worked very well. The men in charge were active, capable men who were anxious to do the work as well as they could. I endeavored to be reasonable myself, and we had worked together before, so we understood one another. I have spent a couple of days in each concern every three or four weeks, examining all work done and looking over the timber ahead to see how it should be handled. In this way we have come through the winter so far with very little friction, and I feel that the work is being done substantially in the company's interest, as near, probably, as it would be done by any of its own men.

One favorable condition I should not fail to mention here is the long established reputation of the company for fair dealing, and the certainty the contractors have in consequence that they will not be subjected to any underhand tricks. As to the volume of cutting that one man can look after in the fashion outlined above, I will say that seven camps have been under my oversight the past winter, scattered over a round trip by the road of 150 miles. The aggregate cut is about 18 millions. Even if a man has no care of supplies that is enough to have under his control.

It seems to me quite likely that what I have written may hit entirely aside the mark as far as relates to your conditions. Spruce timber with us is a commodity in strong demand. Stumpage is worth \$2 to \$4 a

thousand according to location; very small trees have value, and great economy and care in cutting consequently demanded, financially speaking, might think we had secured a good thing. I do not think, however, that we yet do our work as carefully as we should of timber, present and prospective, warrants, it seems to me we ought to have a remodel of organization.

In Canada, on the other hand, I suppose your problems relate to great tracts of natural forest you are only beginning to touch, and on which you sell at a low rate. In respect to such a situation most that occurs to me to suggest is close study of the health and condition of the timber.

Spruce woods contain trees of every age, the coming on to replace the old when the latter die it is natural to suppose that the replacing process is constant, the growth and decay on a tract, year by year, balance one another. As a matter of fact, according to my observation, that is not the case. The history of a tract is more often a wave motion, a considerable difference oftentimes between the growth and the crest; that is to say, for a period of a valley or a township of virgin timber land, the growth is healthy and thrifty, gaining all the time without loss from old age or disease. Then will come a point when things begin to go the other way, a big gale, perhaps, will start it, for some stand once a break has been made in them some keep on down year after year. Insects oftentimes bear a part in the destruction, and fungi, no doubt, the same. But whatever the active agent, over the life of the timber is the great pre-disposing cause of an unusual thing for tracts to lose in this way a course of a few years a quarter, half, or even a third of their value. Now it is evident that in this case, economical handling of large blocks of timber land must take this matter clearly into account. Very likely you in Canada are fully alive to such matters. I hope you are, but I know on this side of the boundary they have been mainly overlooked by explorers and neglected by business men. Whole tracts have died down and owners have hardly been aware of it. On one tract belonging to my own concern I can show where probably \$50,000 worth of stumpage on very accessible land was destroyed and then no realizing sense of it until two years ago. To prevent and controlling these things is one of the most profitable fields of work for well trained men in the lumbering or private employ.

I believe I am the first man calling himself a forester to be employed regularly by an American business concern. It is in this field that I feel surest that the measure has been justified. My work outside the logging has been the survey and exploration of the land on a basis for their operation. Topographical maps and models result from this, also sheets describing the timber. As far as may be, the logging jobs are done on the territories that most need cutting, and done carefully while there to take all the defective timber. The tracts are kept under watch and no big blow-down can occur, nor bog down much of a start without our being aware of it.

What has been lately written gives a clear motive for conservative cutting as we practice it. We have not settled down to the European idea of a high yield, of running a business of a certain volume from a given tract of land. Whatever has been done in the States, knowing what it means, has settled on the conservative. The reason is that we have large tracts of timber that badly need cutting, and the sooner we can get them, saving the dead and declining stuff and leaving them in shape to grow, the better it will be. The chief motive and, balanced by considerable cost and practicability, is the key to our operation along this line.

Of course, expected growth is a consideration as it is not offset by windfall. Then we believe the future better stumpage can be had on the smaller classes of timber. But certain of its tracts the Berlin Mills Company cuts as closely as anyone cares to, if ever in the future the question comes up whether to shrink the volume of manufacture or to maintain it a time longer by cutting the lands down to the practical point, that will be a new question to be considered. For myself and as a forester I feel like following the lead of the Canadians on having retained so much of the timber land of Canada under Government control.