

count, in the nature of the two species, for the spruce is a tolerant species and can stand the light shade which the aspen gives, almost without being retarded in its growth. The only problem is that of the profitable or at least costless removal of the surplus of aspen.

Aspen is by no means a useless weed tree. Not only is it valuable as a mere soil cover, recuperating the soil after fires, but it furnishes an acceptable fuelwood and pulpwood, and even an inferior grade of lumber, especially for flooring. Aspen also lends itself to use for small woodenware, boxes, crates, pails, excelsior. The establishment of industries near or in the reserves using this material is probably possible and should be brought about by investigating the possibilities of securing a sufficient supply of the raw material and other factors favoring such industries.

Unfortunately, it is liable at an early age to rot. Large areas of mature aspen, which look as if they would cut satisfactory saw material, are to the extent of 50 to 80 per cent. "punky," and so far as known useless. The silvicultural problem of re-establishing the spruce must wait upon the solution of the technological problem of finding a use for "punky" wood, or a use where at least a certain per cent. of rot is not objectionable.

Such large areas of pure aspen of all ages are found in these and other reserves that it will become an unavoidable necessity to work in part for aspen reproduction, and in that connection to solve the problem of reducing or stopping the progress of the disease, keeping it out of the younger growths that are not yet affected.

The aspen problem is, indeed, a general one throughout the whole Eastern Dominion; the development of its profitable utilizations should be made one of the studies of the Forest Products Laboratories.

Underbrush Problem.

There is little or no difficulty in establishing spruce under aspen of the shade endurance of the latter, but another, worse inimical agency comes in to make difficulty. The light shade of the aspen favors the establishment of a dense underbrush, especially of hazel, with an admixture of half a dozen other shrubs. This underbrush, keeps out the spruce, keeps it from establishing itself by natural seeding, and would choke it out if planted, and hence must be removed before a young crop of spruce, and even of aspen, could be established. Experiments are needed to determine the cheapest effective method of dealing with this trouble.

The inquiry would be as to whether cutting or burning produce the more favorable conditions and at what time of the year it is best to do the one or the other.

Planting Problems.

The desire of the forester is to secure his crop, if possible, by natural regeneration; that is, to so handle the mature crop that the seeds falling from it establish the new crop before the seed trees are all removed; this in order to avoid the outlay for planting. But there are large areas in these Reserves on which no old crop of desirable species is to be found, and it becomes necessary to establish such species by planting. The problem, then, is to find the most suitable species and the cheapest successful manner of propagation.

To gain an insight as to what species to introduce, trial plantations on a small scale are indicated.

It is my impression that not only in the aforementioned forestless reserves, and where desirable species are lacking, but also in the well wooded ones, planting will be found often preferable to reliance on natural regeneration.

While the apparent economy in relying on Nature's ability to estab-