

tion pays better than forest preservation.

Minnesota Pictures.

Obviously, the people as a whole, being interested in forest preservation, cannot attempt to restrict individual rights, without compensation, for the benefit of the commonwealth.

On the threshold of the 20th century, it would not do to simply forbid the devastation of forests owned by private individuals in the face of the fact, that forest destruction is, from the merely commercial standpoint, superior to forest preservation.

If the people realize, that the maintenance of the forests is a necessity for their welfare, they must be willing to spread over the entire country those—now exceptional—conditions under which conservative management of private woodlands is a safe and remunerative business.

Forestry as an investment is unsafe as long as fires cannot be prevented from destroying the forest. True, the primeval forest is fairly fireproof. As soon, however, as the removal of the mature timber allows the sun to roast the vegetable litter on the ground whilst at the same time inflammable debris is increased, the seedlings, saplings, poles and immature trees left intact by conservative utilization of the forest are badly exposed to destruction by fire.

The virgin forest in America and the well-managed, long, established forest which you find in Germany and France, are fairly fire-proof. The "transition-forest," however, which necessarily leads from primeval conditions to those of regulated production, is very badly endangered by fires. Now, during the transition stage, is the time for action. Sixty years hence the virgin forest will be replaced by a forest allowing of regular management, if protection is carried through, or else will be replaced by barrens, if protection is denied.

For the average owner of woodlands, protection from fire during the transition stage, at his own expense, is practically impossible, the annual outlay being larger than the annual yield of the forest.

Only on very large, compact holdings—say tracts of over 100,000 acres—protection from fire can be effected at a reasonable expense. Still this expense, added to the taxes due annually, gradually grows up to a sum almost covering the gross receipts obtainable from a second growth in the forest.

Let us suppose, in order to clear the situation a little better, that a lumberman working conservatively has left in his forest, per acre, a young and immature growing stock of spruce scaling 1,000 ft. b. m. per acre. After protecting his forest for 20 years, he will be able to cut (compare Pinchot, "The Adirondack Spruce," page 79 ff) 2,000 feet b. m. of mature timber, worth, say

\$3 per acre. The yearly expense of protection from fire was five cents, the yearly taxes were two cents per acre during that period of waiting. Both outlays taken together have accrued, figuring at 6 per cent interest, to \$2.57 in the course of 20 years. Thus a net yield of only (\$3—\$2.57) or 43 cents per acre is left to reward the venture.

The owner cutting slightly and working conservatively takes great risks, because he leaves a large capital exposed to destruction by fire.

The owner cutting heavily and leaving almost no seedlings, saplings and poles on the land, takes small risk. Still in his case the period of waiting for a second cut is so long, that prospective taxes and prospective expenses consume all hope of a remunerative outcome of the venture.

Where protection from fire is absolutely assured, a second growth of trees, in my opinion, cannot be prevented from developing. Even against the wish of the owner the trees will encroach upon the cut-over land. For thousands of years, before the advent of fires, one generation of trees, in the natural course of events, has replaced the other.

Pictures Exhibiting Natural Regeneration in Bavaria and Jack Pine in Minnesota.

Thus, if the people of this country care to engage in a far-sighted policy, if the providential functions of government relative to forestry are understood, let them furnish laws and a salaried staff to enforce these laws by which forest fires are prohibited. Then only we can expect private forestry to be practiced, because then only private forestry is a safe and remunerative investment.

For the Dominion and the Provinces, in their capacity as forest-owners, similar considerations hold good. Both are in the lucky position of owning large and compact tracts, so that the expense of protection, per acre of land, is greatly reduced. Both have the power to enact laws suiting the task, with a view of perpetuating the forest whilst using it. At the same time, the interest of the commonwealth demands, that no acre of virgin forest shall be touched, unless the land is fit for farming, or unless the forest, during and after lumbering is fully protected from fire.

Does forestry mean "economic stagnation?"

It certainly does not.

Forestal Investments.

Forestry means "the proper handling of forest investments." Forestry intends to transform unproductive woodland into a capital yielding large revenue. The forestry investments are cut down, on the one hand, by the removal of mature timber, and are increased, on the other hand, by creating a system of floatable streams, of forest

railroads and wagon roads. By these means the farms and pasture grounds—possibly the mines as well—scattered throughout the forest are made simultaneously accessible and more valuable. The investments are further increased by the expense of land surveys and stumpage surveys. Only on the basis of such surveys a plan for further business operations—notably for railroad building—can be properly draughted. In addition, fire lanes connecting the water-courses (thus joining the natural fire-breaks by artificial ones) might be made, and a system of patrol-trails might be created and hereafter maintained, invaluable in case of fires, helpful in logging operations and welcome to hunter, fisherman and health-seeker.

It should be continuously borne in mind, that the revenue which forestry means to draw from forestal capitals, is not necessarily made up by returns exclusively obtained through sale of timber. If it is financially advisable, with due regard to the prospect of the future, to use forest ground for forest pasture, or for farms, or for the production of tan bark, or for whatever production (rosin, pulp, cork, rubber, fruits, game, minerals) you can imagine, then true forestry means to engage in that most promising industry, or, possibly, in a combination of several of them.

For the commonwealth as a forest-owner, a considerable share of forestal revenue frequently consists of "pennies saved," which, if the old proverb is not mistaken, are in no way the inferiors to "pennies earned."

If by regulating, by handling the forestal investments properly, the manifold losses can be reduced, which threaten navigation, water supply, irrigation, agriculture, public health, property destructible by floods, then every penny saved by such handling and regulating is a penny legitimately earned by forestry. In other words, the gross returns from forestry practiced by the commonwealth are not tangible goods only; the yield of the forest consists, to a large extent, of safety, of assistance, of insurance furnished to the people and to their industrial vocations.

Within the forest itself, these "indirect" blessings are scarcely ever felt. Hence the private individual owning forests does not care to produce them; the pennies saved are not saved for him.

In addition "indirect" revenue cannot be derived from the forest in many a case without curtailing the "direct" monetary revenue. Private forestry, left to itself, cannot be expected to meet the combined tasks.

Where the private forests form a small percentage only of the total forest-area of a country, no harm is done by disregarding them.

In the opposite case, the liberties of the private owner must be restricted with reference to the free disposition