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FORESTRY

From a Commercial Standpoint

Address delivered by F. W. Rane,
Massachusetts State Forester, before
the Massachusetts Horticulture Society,
February Twenty-three, Nineteen Hun-
dred and Seven

FOREWORD

The writer has been unable to supply the requests that have come in for this address, hence it is issued herewith from the State Forester's office for general distribution to Massachusetts citizens

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FORESTRY

FROM A COMMERCIAL STANDPOINT

BY F. W. RANE, STATE FORESTER OF MASSACHUSETTS

HERE are few if any problems of greater moment and more economic importance to the State of Massachusetts at the present hour than that of forestry. Doubtless there are those present who have known this forest patient when she was healthy, vigorous and strong; how beautiful primeval forests dotted this good old Bay State in those days and how, year by year, they have succumbed to our mad rush of uneconomic commercialism, until to-day finds us in a sadly depleted and unrational condition, viewed from the standpoint of modern forest management. It is always easy to point out mistakes after they have happened; but experience, though a dear teacher, is nevertheless extremely effective. Year by year the primeval forest growth was cut and harvested. Second growth, inferior but valuable, has followed, where conditions have been favorable, and this has, in turn, been utilized as soon as it reached merchantable size. Demand for forest products has been increasing in greater and greater proportion as we have been developing the State and nation, while the products themselves have likewise been approaching exhaustion. Our people have looked upon the forest products as inexhaustible, thinking naturally that, though Massachusetts should be depleted, there are plenty of other States at our very doors

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with indefinite supplies. Many of our country-loving and far-sighted citizens have time and again in the past predicted our present calamity; but the commercial era has absorbed us, and the successful business man of America has been the admired of admirers. *Æsthetics* in a new country are as nothing compared with commercial activities, when the bases of the commodities dealt in are free gifts and cost only for the marketing. The balance finally comes with the nation's development.

From the substantial old-time sawmill, — formerly so common upon our streams, now only relics of bygone days, — our evolution has developed to the portable mill. Instead of taking the logs to the mill, we now take the mill to the logs. While it is easy to comprehend this change of milling operations and the economy therein, the effect upon forestry itself and the country community has changed most remarkably. When logs were taken to the mills, most farmers employed their teams and labor during the winter months in getting out lumber for home consumption, but sold enough to make the effort and time profitable. The old-fashioned method, too, of not cutting clean but taking only the larger and mature trees, did not destroy the forest, for replacement followed rapidly. Our present method is to sell the stumpage; and, as the purchaser finds he is able to market every vestige of the product, the forest area is stripped of vegetation. In earlier days this extreme of clearing was done only when the land was to be used for agricultural purposes. Where the larger growth only was taken out in the past, in twenty years or so the same land could be cut over

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again at a profit; under the present practice it will require a period of nearly or quite twice as long for similar results. Again, even the cutting clear practice was not so productive of ill results until it came into such common use. When only here and there a tract was cut, the surrounding growth reseeded it; to-day the reseeded factor, also, is cut, leaving great areas where Nature is unable to assist as formerly. The white pine, for example, will re-establish itself whenever the conditions are favorable. When, as in earlier times, the ill-shaped and limbed specimens contained no commercial value, they were allowed to remain standing. These trees make our best seed trees, hence were responsible for reforesting the land with this species. To-day even these seed trees have value. No matter how pronged or crooked, they will make box-boards, pails, tubs, matches, etc., and bring prices of from \$14 to \$16 a thousand, when delivered. The results of this practice are, as we find them, altogether too common. Portable mills are operating at the present on wood lots that in earlier times could not be used commercially. Where the diameters of trees were thought of in terms of feet, we have simply changed the feet to inches for present practical usage. The commercial pine tree of to-day hardly reaches the seed-producing age before it is harvested.

What is true of white pine is equally true of many other of our forest trees. Our pulp companies chew up practically everything of the spruce and even balsam fir, which a few years ago was considered practically worthless, but which at present is of equal value in limited amounts. Hemlock was little thought of for joists and gen-

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eral framing material in buildings not long since, but our carpenters now are not so particular. The American larch, commonly called tamarack or hackmatack, found growing in low, moist situations, was valueless until railroad ties and telegraph poles grew scarce; and then they found immediate value, now having largely disappeared. Hickory, commonly called walnut in New England, was the only wood thought suitable for tools, ax-handles, whiffle-trees, etc.; but go to the market and see what are being substituted in its place. Of course our tools do not last as long as formerly. Were there time, it could be shown that each and every kind of wood has special qualities that adapt it for specific usefulness. The more we advance in commerce, industries and manufactures, we continue to discover new economic uses for all of our raw materials and products. There is not a species of wood grown at present but has a recognized standard of value. The time has come when simply the growing of cordwood in most sections of Massachusetts is a promising crop. Particularly is this true where the burning of brick is an important industry.

We, as a Commonwealth, are at an extremely interesting stage at the present time as regards our forestry problem. It is not only true of Massachusetts, but of New England and, for that matter, the whole country, to a greater or less extent.

As long as the prices of forest products remained low, we laughed at the idea of forest depletion. Experience is a wise teacher; and although the histories of older countries point out very clearly the mistakes they have made, their errors are seldom heeded in a new country until many of the same experiences have resulted.

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When our forefathers came to these shores, New England was a vast wilderness, a primeval forest. We are told of the magnificent forests, and how individual trees reached great proportions throughout this whole section. Even the decaying stumps still extant remind us that but yesterday, in point of time, these monarchs of the forest which had been growing for centuries were with us. To-morrow a forest tree producing over a thousand feet board measure will be a veritable curiosity. We country-loving and public-spirited people are extremely anxious that the nation reserve certain portions of the White Mountains and the southern Appalachian range, that coming generations may enjoy, take pride in and benefit therefrom. A birthright for them as small as this is a pittance compared with the vast and almost endless expanse of virgin forest areas that was ours.

Viewing the subject as a whole, therefore, we must recognize that the time is ripe for action and public concern. To accomplish results, much thoughtful study and definite systematic planning must be done, in order that there will be no obstructions in the way. Education and example are our tools to work with.

“Forestry is the science and art of forming and cultivating forests; the management of growing timber.” Forestry, therefore, as the title of my address indicates, is concerned with the economic production of merchantable wood and timber. Forestry should rightfully be thought of as a commercial industry. The forest products of a country should be one of her greatest assets, just as much as that of any other crop, agriculturally speaking, and even more to be relied upon than

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our income from mining ; for, with proper management, the investment will be permanent, inexhaustible, and hence fundamental to the nation's life and prosperity.

Lumbering is as important to successful forestry as is the digging of potatoes or the harvesting of any crop when it is ripe. The same essentials of culture, also, must be understood in getting maximum returns in the one case as in the other.

Forestry and commercial forestry are synonymous terms. Forestry in its true sense, when managed properly, will utilize our three million acres of land in Massachusetts, — at present seen scattered in every section, known as waste land, abandoned pastures, sprout lands, barrens, plains, etc., — returning them to forest culture. The same culture that will return saw logs to our mills, make work for our country folk in winter, replenish our town treasuries, repaint the old red schoolhouse, pay the sexton to again ring the church bell, make better roads and, in short, return the former substantial livelihood of country life, will also conserve moisture, protect and enrich the soil, give an equable climate and return to Massachusetts and New England the natural beauty we all would love so much to see.

If commercial forestry will do this, the æsthetic man, who now and then sets out a shade tree and spends more time criticising the practical lumberman, can employ his time to better advantage.

Our portable mill operators, who are to be found in nearly every country town, are, generally speaking, our best and most public-spirited citizens and, as a matter of fact, the leaders of the communities. These men also are the most approachable men in the world, and willing to foster and

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further every reasonable and commendable project. These men, I am confident, will be the men of the future, to be relied upon to do things in forestry. The fact that forest products are valuable and likely to increase rather than diminish, — it being an easy matter to demonstrate, even at present prices, that reforestation and better forestry management will pay, — gives life and interest to the undertaking.

Go into any rural section, or city, for that matter, in Massachusetts to-day and discuss modern forestry intelligently, beginning with the collecting of the seed, time of year to gather them, when to plant, how to care for the seedling, distance apart to set for results, when to thin and whether to prune, number of years to maturity, the kind of soils for different species, probable returns upon the investment, etc., and there is little trouble in interesting our people.

For the rest of my time to-day I want to give some forestry data likely to be of interest. Any data given upon forestry is, generally speaking, only suggestive; but if the basis of estimating is also given, comparative adaptations can be made where conditions vary.

In giving the following estimates, I have taken precaution to be conservative. It is better, it is thought, to give the data as it really exists, although the picture may not be as attractive. The rate of interest, the price of land and the assessed valuation upon the increment growth are all variable and elastic factors for basing computations.

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PROFITS FROM WOODLAND UNDER PRESENT CONDITIONS IN MASSACHUSETTS

Term of years, forty. Taxes and valuation, figured at 4 per cent, compound interest. Average price of woodland, free of growth, estimated at \$6 per acre. As the trees grow, an addition of \$5 per acre every ten years is allowed, as follows:—

First ten years,	\$6 00
Second ten years,	11 00
Third ten years,	16 00
Fourth ten years,	21 00

The average tax rate throughout the State is \$17 per thousand.

Second growth white pine, chestnut and sprout hardwood growth are those we are most familiar with.

(I) SPROUT HARDWOOD GROWTH

In sprout hardwood growth it is generally considered that a cord per year can be obtained in average conditions on an acre. Therefore, forty years equals forty cords; stumpage value, \$50 to \$80, depending on locality and proximity to market.

INVESTMENT AT END OF FORTY YEARS

Compound interest of valuation, \$6, for forty years, \$22 81

Taxes, with interest:—

First ten years,	\$3 97
Second ten years,	4 48
Third ten years,	4 83
Fourth ten years,	4 29
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	17 57
Total cost,	\$40 38

Profit, \$10 to \$40 in forty years per acre, or 25 cents to \$1 an acre per year.

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(2) CHESTNUT GROWTH

Can expect about 100 good telephone poles or 300 ties with 15 cords of wood, total net approximate value of \$100. Investment at end of forty years, same as for sprout hardwood growth, \$40. This leaves a net profit of \$60 per acre in forty years, or \$1.50 a year per acre average.

(3) SECOND GROWTH WHITE PINE (NATURAL REPRODUCTION)

From actual measurements, this growth was found to yield on an acre 25 cords of white pine and 15 cords of hardwood. White pine is worth \$5 per cord net for lumber, and hardwood for cord wood 1. Total, 40 cords, equals \$140. Deducting \$40, the investment, which is the same as for sprout hardwood growth and chestnut, leaves a net return of \$100 an acre in forty years, or a net income of \$2.50 a year per acre.

(4) NATURAL PASTURES (SO CALLED)

There are in Massachusetts over 1,000,000 acres of pasture lands. Assuming that all cattle and sheep are pastured at the average rental, statistics show that these lands do not average \$1.50 a year per acre. If from this sum we subtract \$1 a year, the amount allowed for taxes on valuation and compound interest on valuation, the same amount as allowed in the case of forestry lands, the net income for an acre per year is only 50 cents. This shows that there are thousands of acres of pasture lands in Massachusetts that rightfully and economically should be turned over to forestry.

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Time was when this State was a great producer of grazing animals that were raised at a profit. Conditions now are greatly changed; and if we have learned anything in scientific agriculture in recent times, it is that concentration on smaller areas and a more definite rotation of crops make the successful farmer. This same logic and philosophy turn over acres upon acres of lands of our farms, at present in an unproductive and unprofitable stage, to an industry with not only great possibilities commercially, but improving a condition at present greatly needed.

(5) WHITE PINE PLANTED (NURSERY STOCK)

White pine seedlings, set 6 x 6 feet, require 1,210 per acre. Two-year seedlings are worth \$5 per 1,000.

Compound interest on valuation, \$11, for forty years,	\$41 81
Compound interest, 1,210 seedlings, at \$5,	\$6 05
Compound interest, transplanting 1,210 seedlings,	4 95
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Total,	\$11 00
\$11 at interest for forty years,	52 80
Taxes, with interest:—	
First ten years,	\$6 63
Second ten years,	7 15
Third ten years,	6 34
Fourth ten years,	6 33
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	26 45
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Total cost,	\$121 06

Product at end of forty years, 40,000 B. M. feet, at \$5, equals \$200, leaving a net profit of \$78.94, or \$1.97 a year per acre.

These figures are based upon the maximum

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cost of seedlings and planting, also the valuation of pasture land at \$11, instead of waste lands, as considered under (1), (2) and (3), at \$6.

(6) WHITE PINE PLANTED (HOME GROWN OR NATIVE SEEDLINGS)

Compound interest on valuation, \$6, for forty years,	\$22 81
Initial outlay for seedlings and planting, \$5 per acre,	
plus interest for 40 years,	29 00
Taxes, with interest, forty years,	17 57
	<hr/>
	\$59 38

Returns at end of forty years, 40,000 B. M. feet, at \$5, equals \$200. Subtracting cost, \$69.38, leaves the net profits in forty years \$130.62, or an average of \$3.26 a year per acre.

Reducing the whole to tabular form, we have the following:—

1. Under favorable natural conditions of reforestation; returns per acre in forty years and average an acre each year:—

Growth:—	Per Acre in Forty Years.	Aver. an Acre Each Year.
Hardwood,	\$0 00 to \$40 00	\$0 00 to \$1 00
Chestnut,	60 00	1 50
Second growth white pine, .	100 00	2 50
From pasture land, valuation \$11, average \$0.50 an acre per year.		

2. Where trees are planted; returns per acre in forty years and average return an acre each year:—

White pine:—	Per Acre in Forty Years.	Aver. an Acre Each Year.
Valuation, \$11.		
Seedlings, planting, \$11 + . . .	\$70 00	\$1 75
Valuation, \$6.		
Seedlings, planting, \$5,	130 62	3 26

From these calculations it is shown that, even under present conditions, forestry can be practised

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commercially with a reasonable profit. As a long time investment the returns must be considered as offering exceptional opportunities. The rate of interest under each example cited, per year, for the principal first used, at the end of the forty year period, is in each case as follows : —

	Per Cent.
(1),	0 to 16
(2),	25
(3),	41
(4),	4
(5),	9
(6),	29

No matter how attractive we may make it, the fact still remains that few people are willing to make long time investments and wait for their fruition. The time is coming, however, when far-sighted business men will recognize this source of investment as a safe and profitable one. The State of Massachusetts, it is believed, can well afford to make a beginning in this direction by purchasing at low cost much of our cheap lands and restocking them as forest reserves. Not only can they be made a valuable asset in the future to the Commonwealth, but to serve as examples of forestry methods.

Forest fires are a great menace to practising modern forestry in Massachusetts and are undoubtedly one of the greatest drawbacks to forestry undertakings. Our present laws regulating this problem are not effective enough. We have bills before the present General Court of Massachusetts looking toward an improvement in this direction. [Has become a law.]

The laws relative to the taxation of forest lands are in no way systematized or deduced to secur-

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ing the best results. It is to be hoped that some simple, practical and expedient forest taxation laws may be formulated at an early time.

The greatest of all needs, however, — and we must come back to it as the foundation upon which our whole forestry structure must stand for success, — is a well-defined educational system, by which our people may be taught not only to recognize the importance of forestry, but how to get best results from a practical knowledge of the theory and practice combined.

In conclusion, I would say, let us be wise and farsighted. The Massachusetts and New England of the future will be what you and I make it. History repeats itself. In the Old World the rise and fall of the Roman Empire had its associations with commercial forestry. Spain, — once the country of equable climatic conditions and beautiful meadows, the native country of the merino sheep and a progressive and prosperous agriculture, — has cut down her forests, denuded her mountains; and what is her present condition? We are told that in Biblical times certain valleys in Palestine were so fertile that they sustained and nourished great flocks and herds. Figuratively speaking, these valleys flowed with milk and honey. In those days the cedar of Lebanon and other forest trees were found in all their glory. What sort of a country is Palestine to-day? Travellers tell us it is dangerous to travel without a guide; the country is parched, dry and desolate.

What do we propose for the future of this nation or, for that matter, Massachusetts? If we are public-spirited, as I believe we are, and have a love for our country and Commonwealth,

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we will awake to our responsibility ere it is too late.

Instead of following the example of countries like those mentioned, let us emulate the example of Germany, where modern forestry is practised successfully. Then, and only then, can we feel proud in believing we have done our full duty toward the forest interests of our native land.

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