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ADDRESS ON FORESTRY

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THE F. Harold Daniels School is devoted to the training of young people of high school age in forestry and conservation. In a broad sense it is devoted to training in understanding the proper use of the land. It is particularly fitting that a school of this should be established, not only because it can make these young people conscious, at a formative age, of the real and pressing problems in the use of the land, but also because it will extend their horizons in the whole field of natural history.

Forestry is a field of endeavor whose purpose is the efficient production and use of trees. The trees are used primarily for the wood they contain. Secondary purposes are for the control of erosion, the maintenance of water supplies, and for recreation.

It has been said that our civilization is coming into an age of wood. Certainly there can be no question that the world is experiencing a rapidly increasing need for wood and wood products. A century ago most of the wood used was in the form of lumber, or it was burned as fuel. We still use great quantities in these two ways, but now our natural human inventiveness has led us into many other uses of wood. We slice it thin and stick it together in sheets to form plywoods which have properties more desirable for some purposes than the original lumber. We grind up the wood and then compress it at high temperatures to produce extremely durable materials for construction purposes. Or we digest shredded wood with chemicals, releasing its fibers for the manufacture of paper and similar products. We have learned to go still further and break down wood into its component molecules which we then re-assemble to form new substances such as plastics. All of these new processes have led to vastly increased demands upon the world's supplies of wood.

Forestry is a comparatively new field of endeavor in the world. Its modern development took place in Western Europe during the 18th and 19th centuries. It is particularly new in America, for it began to take form here only about fifty years ago.

When Europeans first came here they found a gigantic wilderness of trees. There was such an abundance that no one saw a need for guarded use and conservation. In the regions of good agricultural soils the trees were a nuisance to be got rid of by any possible means. It was in this atmosphere of abundance that American forestry was formed and had its growth. The training of foresters was primarily for the orderly and profitable liquidation of trees, or for the protection of forests which were to be cut in the future. We still have huge resources of virgin timber, but they are at ever-increasing distances from the centers in which the wood must be manufactured and used.

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Most of the timber that has been cut in America has been cut without any thought for its replacement. In many cases this has not been disastrous, for the forests have reproduced themselves without help. Over great areas, however, they have failed to do so or have been followed by forests of slow growth and low value. Western Europeans saw the seriousness of this situation on their lands many years ago, and began to correct it with effective laws and systems of forest management that were designed to keep their woodlands in production. In America we are far behind in this respect.

But with the progress that has been made in forest production, both in Europe and America, we must realize that we have scarcely begun to attain the successful culture of forest trees. This can be illustrated by a comparison with agriculture. A modern farmer can examine the soil, get information about climate and weather, and then decide whether or not he can grow wheat or corn or potatoes or apples on his land. Having made his decision, he clears his land of all natural vegetation, and alters the soil both chemically and physically to suit the requirements of his intended crop. He has a wealth of known genetic strains of food plants from which to select the ones most suitable to his specific needs. He successfully protects his crop from pests and diseases, and in these modern days there is some evidence that he can make the clouds disgorge rain if needed. His success is usually credited to the efficiency of modern agricultural science.

With the ever-increasing demand for wood we cannot depend indefinitely upon uncontrolled and unassisted natural regeneration. We must learn how to grow trees. Herein lie the most pressing problems in all of forestry.

Those of you who are here for an introduction to forestry, and to the use of the land for forests or wildlife, will have many fascinating experiences. You will learn what the trees of this region are—their names, the characteristics by which you can tell them apart, the kinds of places in which they grow best and most abundantly. You may learn something of how to describe and measure them, to determine how much wood there is in them, and something of the quality of the wood. You can learn what kind of diseases and insect pests, and the kinds of wildlife they harbor. You can learn something about their uses, and how to cut and get them out of the woods. There will be something for you about the culture and management of trees—how they should be planted and what kinds of trees should be selected for planting.

These are all parts of the field of forestry. They are essential to a forester's practical efficiency. The owner of a stand of trees wants to know what it is worth, whether for tax evaluation or as an investment. To find what it is worth one must know the values in it and how to measure them. A representative of one of the large paper companies of the Northeast—a company that owns upwards of 2,000,000 acres of forest land—told me that of every four cords of wood growing in their forests they can expect to get only three. Insects and fungi get the other one. Owners of land who want to reforest it, or to

manage existing forests for increased production, will want to know the most efficient way to do these things, and the ways that have the greatest chance of success.

With all your pursuit of the various phases into which the field can be divided, don't forget the woods for the trees. If I have a suggestion of first importance, it is that you learn to see the whole forest and the land on which it grows, and then learn to use the various parts of the discipline of forestry to help you question what you see. Of two trees standing together, both of the same species, one often has a straight trunk and the other a crooked one. As a forester interested in the production of lumber you will be interested primarily in the straight one. To develop a forest in which all the trees are straight requires that you know, and can eliminate, what makes them crooked. It is not enough to *see* that they differ—you must question why.

I could illustrate the importance of this habit of observation and question by a host of examples, but I shall select only one. Those of us who lived in southeastern New England on September 21, 1938 will not forget the hurricane which came at that time. The storm blew down most of the standing merchantable timber in its path. Nothing resembling it had ever been seen or thought of by the foresters working in this region. We began to wonder how we could manage our forests in such a way that if another such catastrophe should come we would have our stands of trees in such shape that they could withstand it.

Those of you who have walked through the woods of this part of the country, particularly the older forests that are in woodlots which were never cultivated, will remember that the surface of the ground is never even. It is covered with hummocks and depressions, some of them made of rocks but more of them of soil. A few students had recognized that some of them were mounds of earth thrown up by the uprooting of trees. The hurricane of 1938 taught us that they are unquestionably the result of past hurricanes similar to the one we have experienced. Historical studies prove that there was a major hurricane in 1815, at least one during the 1700's, and one during the 1600's. Clear evidence of them has been here, in plain sight and under our feet, but we failed to investigate and use it.

Along with seeing and reflection should go experiment. We should remember that those prehistoric farmers who learned to cultivate crops were not content with seeing how their food plants grew in the wild, but took the all-important step of trying to grow them as crops. There was no way for them to know, without trying, whether they could duplicate the habitats of their potential crop plants and bring them under control. Likewise we have no way of knowing what we can do with the forest trees about which we know so little. Many such experiments with trees will seem haphazard and foolish, but if they are based upon sound observation, they will not be foolish, but will make contributions toward finding out what we can and cannot do in the domestication of forests.

Let me say again that the proper use of the land for the production of

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AUTUMN

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pens one may well say as the farmer goes out into his fields, that there will be a killing frost tonight. That is the sign and that is the picture. Draw the sashes on the violets' outdoor frame, cover the plants tightly with straw mats, bags or old blankets, muffle a few pet border things to give them a last chance, for the frost will come tonight and will kill nearly all of the living things. The wife takes in her geraniums slipped into tin cans, the amaryllis from the south porch, her cacti, and fuchsia, putting them into the warmest window in the kitchen, takes them from the shed, and brings them into the house, there, to spend the remaining days of fall and winter, bringing cheer to her life, and love to her heart. The apples come in from the shed, the tomatoes are kept for seed, an old quilt tucked about a ragged chrysanthemum and they too, begin to bloom for the last time until fall again shall bless the countryside.

Courtesy WTAG.

I notice that many plants about this time of year (November) or earlier, after they have died down at top, put forth fresh and conspicuous radical leaves against another spring. . . .

—*Autumn,* Henry D. Thoreau

FORESTRY

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forests, whether for wood, water conservation, wildlife or recreation, is a relatively new and challenging field of study. With a few minor exceptions, wood is still a wild crop which we gather from the store that nature provides. To satisfy new and ever-increasing demands for wood we must look forward to a time when nature's store will be exhausted, and when we must be able to grow our wood as we grow our food plants. This is the basic challenge to forestry.

SPORTSMAN

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Here was a case in which the balance of nature had been upset—by nature herself! Sportsmen wasted no time lamenting the tragic fate of the woodie, however: under the supervision of the state's Bureau of Wildlife Research & Management, they launched a housing project for ducks!

The hunters, who were promised no chance to shoot these birds, cooperated in an all-out compaign to erect thousands of specially designed nesting boxes. Success was immediate: the woodies came back like wildfire and, last year, after management authorities proved that the trim little waterfowl were well established, shooting was permitted on a minor scale.

This was no great triumph for "bloodthirsty" gunners. The waterfowl hunting season slated for Massachusetts arrives so late in the year that practically all of our native wood ducks are long gone in the fall migration. Of those that continue to pass through the Commonwealth, sports-