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Suggestions for the observance of Arbor
Day by the public schools of Maine.
Selecting and planting trees by
Gordon E. Tower.



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SUGGESTIONS FOR
Selecting and Planting Trees

By GORDON E. TOWER, M. F.

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SUGGESTIONS FOR THE
OBSERVANCE OF
ARBOR DAY

BY THE
PUBLIC SCHOOLS OF MAINE
WITH SUGGESTIONS FOR SELECTING
AND PLANTING TREES

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ARBOR DAY

By

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The idea of having a day set aside to be devoted to the planting of trees originated with Governor J. Sterling Morton, of Nebraska, the idea taking concrete form in 1872 when the State Board of Agriculture of that state appointed a day as Arbor day. From that time on the movement gained favor until now the day is observed by every state in the Union.

The chief lesson which has come down to us from the past observance of Arbor Day is that it is a day set aside for the planting of trees with the work centered largely, if not entirely, in setting out individual trees for ornamental purposes. In the effort to make Arbor day serve a useful purpose in the forestry movement, this feature has been made the most prominent so that many people still believe that forestry consists only in the planting of trees.

The true significance of trees in the life of the nation has been lost sight of in poetry and sentimentalism which have characterized the exercises of the day, and instead of directing the attention of business men to the larger economic and practical questions involved in forestry, have made them regard the movement only as a fad.

The planting of individual trees can rightly be made one of the chief features. The exercises, too, can center about the planting but they should be so planned and selected as to bring to the pupil's attention in a simple, direct way other facts than merely how to plant the tree and care for it. The isolated trees planted along the roadside and in the city streets give an added charm and beauty; those around our houses are not only beautiful in themselves but they furnish refreshing shade in the summer and in the winter may even save on the fuel burned by pro-

tecting our houses from the cold winds. As a feature of the day proper attention should be directed to the planting for such purposes.

The tree that is of greatest significance to us as a nation, however, is the forest tree, because it serves so many useful purposes. It is our forest trees which help to hold back and store up the water for our streams which supply power for mills and which are used for navigation, or from which water for irrigation and drinking purposes is obtained. Then, too, the harvesting and conversion of the products of the forest every year furnishes employment to many thousand people. In fact it is the tree in the forest which has made our state prosperous and we must, therefore, give more and better attention to the forest trees if we are to continue to maintain our place in the nation.

It is this idea that is the basis of forestry, and that is kept in mind when forestry is practiced. Here then is the truer and broader lesson of Arbor Day and with this in mind the aim should be to impart, especially to the children, such knowledge of forestry and its relation to the welfare of the nation as their minds are capable of grasping. However modest the work of Arbor Day, it may be made a step in the right direction by bringing to mind a great many important facts of significance in forestry.

SUGGESTIONS FOR ARBOR DAY.

The relation of the forest to the regularity of flow of streams can be made a subject for discussion. The attention of the pupils can be called to the washing away of the soil and the formation of deep gullies on steep hillsides where the forests have been removed and if the soil is thin how it is often completely washed away leaving nothing but the bare rock. Then how this soil is carried into the streams causing the muddy freshet in the spring and after a heavy rain storm; and how the load of silt and sand carried by the water is deposited in the channel of the stream and is even carried down to fill up our harbors so that, in the latter instance, much costly dredging is necessary in order to keep the harbor passable for ships. The washing of the soil can be seen on any steep exposed embankment and on plowed hillsides.

One or two simple experiments may be performed by way of illustration. A little soil may be stirred in a glass of water and then allowed to settle to show how the stream remains muddy when it flows swiftly, and how the load of silt and sand which it carries settles to the bottom in the more level portions of the stream.

The great value of the forest on the mountain slope and on steep hillsides can be illustrated by means of a board 12, 14, or 16 inches wide and 2 or 3 feet long placed at an incline on a table. Then with a garden sprinkling can pour water on the board and see how quickly it runs off. Next put some soil on the board and pour water on this. The soil at first takes up the water until it becomes saturated and then if we continue to pour on the water the soil begins to wash away just as it does on the mountain slope when the forest is gone. Now, renew the soil on the board and put over it a layer of fine sawdust or finely divided vegetable matter from the woods to represent the layer of leaves and humus in the forest; then pour the water over this with the sprinkling can. After a time the water begins to trickle out from the lower edge of the soil and its covering, and runs off gradually. This will serve to illustrate how the layer of leaves and humus acts as a sponge to absorb the rain and store it up in the soil to appear later in the form of numerous springs to feed the streams long after the wet season is past, thus regulating their flow and furnishing a supply of water during the dry season.

The teacher can carry the illustration still another step farther by holding a few small branches of fir, spruce, or pine above the board in imitation of the canopy formed by the branches of the trees to show how the trees dissipate the force of the rain as it falls, and prevent the evaporation of moisture from the forest soil so that more of it sinks into the ground to appear later in the form of living springs.

The many uses of wood can be made the basis for subjects for Arbor Day compositions or short talks by the teachers. With the exception of air and water, wood is the most abundant of nature's gifts offered for man's use. We can form no idea of the hardships that would have to be incurred by us as a nation if we were suddenly deprived of our supply of wood. The houses in which we live are largely made of wood and the fuel

commonly used to warm them is wood. Even the match used to kindle the fire or light the lamp is largely made of wood. The material for tables, chairs, and desks in the house, for the wooden parts of carriages and wagons, for the handles of axes, shovels, rakes, and a hundred other implements in common use as well as that for paper stock for books and newspapers is taken from the forest.

In comparison with iron or stone, wood is easy to procure and easy to work, and easy to place in position. This fact alone makes it especially desirable to say nothing of the pleasing effects to be secured from wood when it is properly polished, filled, and covered with a transparent material like varnish.

Likewise the flowers and seeds of trees are interesting subjects for compositions by the pupils or talks by the teacher and can well be made a field for investigation at other times than on Arbor Day. Even though flowers of the trees may not be available on Arbor Day, there are many interesting facts of botany which might be mentioned and discussed at that time. There are some trees which produce perfect flowers that pollinize their own pistils as for instance the black locust and basswood; other trees like the pines, spruces, beech, and oaks produce the two kinds of flowers, staminate and pistillate, separately on the same tree while trees like the willows, cottonwoods, and ashes produce the pistillate flowers on one tree and the staminate on another. In the case of the last two classes the means by which the pollenization is accomplished at once suggests another most interesting subject, namely, how the pollen is blown by the wind or carried by insects and the many interesting and even intricate devices of nature to secure and insure pollenization.

There are different adaptations for the distribution of the seeds. Some, like the pines, spruces, and maples, are provided with a wing so that they are carried by the wind; seeds of the cottonwoods and poplars are very small with a fuzzy thread-like attachment that is very buoyant so that the seeds are often transported long distances through the air. Some seeds are produced in a pod, the honey locust being an interesting example. The pods of this tree on drying become twisted spirally so that when they fall to the ground or on the snow they are more easily blown about by the wind, especially if there happens

to be a crust on the snow. The seed of the wild cherry, for example, is distributed by birds which eat the fruit to get the edible pulp surrounding the seed. And then there are some seeds like those of the oaks, hickories and butternuts which are heavy and are not easily distributed except perhaps by man or animals like the squirrel. In the fall of the year when so many seeds mature, a collection could be made by the teacher to be used for illustration of an Arbor Day talk.

Forestry is also a good field for nature studies and the interest in the day can be made keener and the value of the instruction much greater if some nature study can be carried on during the school year. Besides the trees in the woods, there are the beautiful flowers and other vegetation of almost endless variety associated with the forest growth, the insects, birds, and animals that dwell in the forest, all of which charms the youthful mind and forms an excellent opportunity to stimulate the faculty of investigation in the pupil, leading them into fields of their own discovering, besides being a means of keeping the youthful faculties in touch with the world of reality.

A collection of tree seeds can be made by the children in the spring or fall, the latter time perhaps being preferable because of the larger number of different kinds of seeds which mature at that time. These could be planted at school in window boxes where their growth could be watched during the winter or out of doors in a bed in the school garden; or if the school is not so fortunate as to possess one, in a bed prepared especially for the purpose. Some seed like that of the pines and the spruces for instance must undergo a short resting period before germinating. Seed of this kind could be stored in sacks in a cool, dry place and sown in the window boxes in February or March or reserved for the outdoor sowing. Such seed would be all right if sown in the boxes in the fall, because that is nature's time for sowing, and would germinate after a time, provided the soil is kept moist. Even when sown under the most favorable conditions it is often two weeks before such seed commences to germinate. In fact with a good many different kinds of tree seed a longer time is required for them to start than is the case of corn, wheat or garden seeds.

Suggestions for Planting.

Planting may be done in the fall after the growth of the season is completed or in the spring before growth begins. Planting in the spring may begin as soon as the frost is out of the ground enough to permit the trees being set at the proper depth.

It would be better also if the planting could be done on cool damp days. Sunny, windy days increase the danger of injury if the roots become unduly exposed.

A thing of fundamental importance to the success of the planting work is never to leave the roots exposed. If the trees are procured from the woods or fields in the immediate vicinity certain rules should be observed.

1. Procure as much of the root system as possible with trees under three feet in height. With larger trees procure as much of the root system as can be conveniently handled.

2. Dig the trees out. Do not pull them up as it is very apt to injure the roots.

3. As soon as a tree is removed measures should immediately be taken to protect the roots. This can be done by covering with moist soil or wet burlap.

4. Keep the roots protected all the time while the trees are being transported to the place where they are to be set out and until ready to place in the ground. Wet burlap sacks are excellent for this purpose. For small trees which could be carried in a basket, damp sphagnum moss, or even damp leaves could be used instead of the burlap. Whatever material is used, care should be taken to keep it damp.

5. Set the trees so that they will be at the same depth as in their original position *after the soil has settled.*

6. Never prune the tops of conifers.

If the trees can be taken up with a ball of earth about the roots it will add materially to the success of the work, and the precautions mentioned to prevent the drying out of the roots are not then so important. It would be well, however, to wrap the ball of earth with burlap to hold the soil in place. It should be remembered also that seedlings which have been accustomed to growing in more or less shade do not, as a rule, succeed as well at first when given the full benefit of the sunlight.

If the trees are purchased of a nurseryman they should be unpacked as soon as received, and the roots protected by "heeling in" the trees, that is, burying the roots in fresh soil until time to plant. This will not be necessary, of course, if the planting can be done at once.

By arranging with some owner to plant a few trees in a field unsuited for raising crops or on an area cut over in the woods, or even a row of trees to serve as a windbreak, would broaden the scope of the work. And no matter how few trees were set out it serves to illustrate planting for practical purposes. In this way the work could be done just as it is in commercial planting.

Arbor Day is not the only time of year when trees should be cared for and remembered. Newly planted trees, especially, need attention throughout the season. The ruthless injury done to trees by children, sometimes of such a nature as often to become an act of vandalism, needs to be discouraged at all times. A broken limb or wound in the bark makes an opening where dangerous insects may enter, or fungus diseases get a start, either of which might eventually cause the death of the tree.

SOME CONIFEROUS TREES SUITABLE FOR ORNAMENTAL PLANTING.

NATIVE SPECIES.

WHITE PINE makes its best development on fertile, well-drained soils but will grow on sandy soils and in moist situations.

RED SPRUCE grows best on well drained upland soils. It is often found in moist places and on thin soils but in the latter situation does not make its best development.

HEMLOCK prefers moist, cool, and shady places, and a sandy loam soil for its best development, but like other trees will grow in poorer situations.

RED OR NORWAY PINE is naturally adapted to grow on poor sandy soil. When planted on richer soils it makes a more rapid development. It should not be planted in wet places or in soil which is not well drained.

INTRODUCED SPECIES.

AUSTRIAN PINE grows well on sandy loam, or clay loam soils having a good drainage and will also make a good development on poorer soils if there is good drainage. It cannot be expected to succeed in wet places.

SCOTCH PINE grows naturally on poor soils but can be planted on fertile sandy loam soils of good drainage. Like the Austrian Pine it should not be planted in wet soil.

NORWAY SPRUCE succeeds best on fertile, fresh, sandy loam soil. It is used very extensively in ornamental planting.

EUROPEAN LARCH. This tree can be planted on poor sandy soils or on better soil of a sandy loam character. As a general thing it is much better for planting than our native larch.

SOME DECIDUOUS TREES SUITABLE FOR ORNAMENTAL PLANTING.

NATIVE SPECIES.

WHITE BIRCH thrives best in a rich moist soil.

BEECH requires a rich upland soil for its best development although it is found growing naturally on ridges having a shallow soil.

RED OAK succeeds best in rich upland soil but will grow in other kinds of soils and situations, even on the poor thin soil of ridges.

AMERICAN ELM prefers rich bottom lands and the moist soil along streams. It grows well, however, in fresh, fertile soil on higher land back from streams.

SUGAR MAPLE makes its best development on rich, moist, upland soils.

SILVER MAPLE grows naturally on sandy banks along streams but does very well in most sandy loam soil on higher ground.

RED MAPLE is naturally a swamp tree and therefore adapted for planting in wet places. It can be expected to succeed very well on higher ground in moist sandy loam or clay loam soils.

BASSWOOD requires a rich soil for its best development.

WHITE ASH succeeds well on rich, rather moist soil of low hills and can be planted in fairly wet soil.

TREES SUITABLE FOR WINDBREAKS...

White pine	Red Spruce
Norway spruce	

TREES THAT WOULD BE USED IN COMMERCIAL PLANTING.

White pine	Red oak
Red spruce	Red maple
Red pine	White ash
European larch	

REFERENCES.

The following list of books and circulars is appended because of the help they may be to the teacher in suggesting subjects for talks to the pupils:

Gifford, Practical Forestry, Putnam, \$2.00.

Roth, First Book of Forestry, Ginn, 90 cents.

Marsh, The Earth as Modified by Human Action, Scribner, \$3.50.

Forest Service Circular 130—Forestry in the Public Schools. Government Printing Office, free.

Forest Service Circular 14—What Forestry has Done, Government Printing Office, free.

Apgar, Trees of the Northern United States (Botany), American Book Co., \$1.00.

Dame & Brooks, Handbook of Trees of New England, (Botany), Ginn, \$1.50.

The department will be glad to render all assistance possible and invites correspondence from any one desiring further information. Address all communications to Gordon E. Tower, Orono, Maine.





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