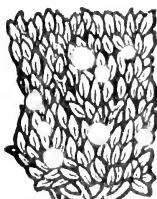


ORNAMENTAL TREES AND SHRUBBERY

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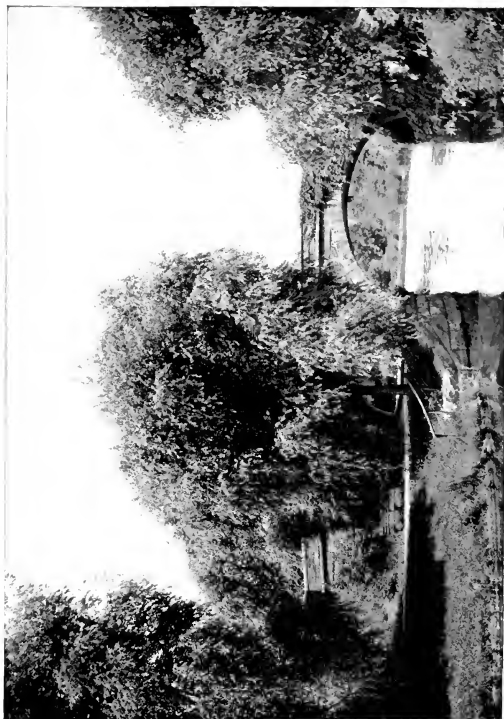
ARBOR · DAY ANNUAL · 1913



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ORNAMENTAL TREES AND SHRUBBERY

NEW YORK STATE EDUCATION DEPARTMENT
ARBOR DAY ANNUAL
MAY 2, 1913

COMPILED BY
GEORGE MARTIN WILEY
Chief, Administration Division



The orange-colored flowers of the trumpet vine attract the humming birds

THE SIGNIFICANCE OF ARBOR DAY

ARBOR DAY in its broad significance has far outgrown the thought of its founders. In its beginning it signified little more than the planting of a tree. Today it is closely related to the whole "out-of-door" movement.

The great improvement in the appearance of school grounds during the last few years has been a direct result of the observance of Arbor Day. Only a few years ago in our larger villages and cities little thought was given to the grounds surrounding the school. Today, however, there are few schools in the State, even in the rural communities, where there is not a real pride in the school surroundings.

Such pride is proper. There is as real educational value in well-kept grounds as there is in appropriate decorations in the schoolroom. School boys and girls will become stronger and better men and women through the almost unconscious influence of the beautiful in nature.

Arbor Day should be a day of beginnings, which should last through the entire year. If a tree or shrub is planted it must be given care. The setting of the roots in the soil is only the first step. The necessary watering, the placing of guards and the watching against injurious insects and other enemies give opportunity for the exercise of constant, intelligent thought. Without continuing throughout the year the work begun on Arbor Day, the whole effort is lost and the lessons of real worth forgotten.

The question is often asked, "What trees shall we plant?" Select the trees of your own locality. It is a most interesting study to search out the important species in any given section of the State and to note their habits. The list in many cases will be long and will include many ornamental trees. Such excursions might well be made the nature study work during the spring months and also furnish excellent material for classroom exercises. With the vast inroads which are being made upon our forests it may be only a few years



Ornamental shrubs, grass and vines

until the virgin forest will be only a memory and our excursions will be limited to cultivated forests and ornamental trees.

We are only beginning to appreciate the great beauty of shrubbery. It not only has a distinct value in lawn treatment but may be used very effectively where trees would be undesirable. Shrubbery, or hedges, may be found today on many school grounds and doubtless the use of these will soon become much more general.

In selecting a special theme as has been done the past few years it is not the thought to limit the exercises in any way to the subject chosen. Local conditions may be found which will render an entirely different program of much more value. The school garden may be the center of outdoor activity. If so, let this be emphasized. It may be that the addition of small shrubs or hedges may add something in an ornamental way. This feature of school work which in so many places has given both pleasure and profit is doubtless a result of the Arbor Day movement. School gardens are daily teaching lessons which can be learned only by actual contact with nature and with the soil.

In the observance of the day make use of any material at hand from which the best results may be secured. This may relate to the general appearance of the school grounds, ornamental trees, shrubbery, the school garden, the study of agriculture, fruit trees of the locality, the farm wood lot, or even the more general subject of our forests. The vital point is not so much the special subject considered as the relating of the day to the real activities of the life of your community. The work begun on Arbor Day, even though it may be the mere planting of a vine, must be only a beginning. The results must be enduring.

A. S. DRAPER

Commissioner of Education





An avenue of oaks and poplars

THE PLANTING AND CARE OF TREES AND SHRUBS FOR ORNAMENT

ONE of the great influences that has worked toward the attainment of a high state of civilization has been the love for the beautiful in art and nature; and the greater of these is the beautiful in nature: omnipotent, where the ruthless hand of man has not despoiled it in his greed.

It is interesting to note that the earliest exponents of organized society among ancient nations, either selected beautiful groves or wooded slopes for their religious or philosophical discourses, or if such places were not available, never failed to adorn the surroundings of their temples and halls of learning with ornamental trees and plants. In fact there can be no doubt that the first ornamental plantings on earth were those connected with the temple grounds of China, whose civilization probably antedates that of any other nation.

At first only those plants indigenous to the neighborhood were available, but as venturesome explorers began to penetrate into unknown lands they brought with them upon their return the seeds of the plants of such countries as they had visited, always selecting, as is human nature, those which were to them the most strange and beautiful.

As time went on plant breeders began to help in the work of increasing the number of trees and other plants until we now possess a vast amount of material suitable for almost any soil or situation. Nor has this work of



The hydrangea blossom



Hydrangeas in full bloom

supplying ornamental plants ceased. With increasing knowledge plant breeders are doing greater work than ever and our universities and botanical societies, and most important of all, the United States Government, through the office of foreign seed and plant introduction, are sending out expeditions that are searching the globe for new material.

Naturally, the very fact that we have this embarrassment of riches makes it more difficult to select the specific plants that are most suitable for any given position, environment or soil, and it is the purpose of this article to give some information on this subject.

Of course the places most in need of ornamentation of trees and shrubs are those great aggregations of houses in which nature has been utterly defiled, our cities and towns. Unfortunately the plants available for just these places are comparatively few, because the unnatural conditions created exclude many of our handsomest trees. Very few evergreen trees, for example, will thrive in large cities or even in towns where great manufacturing plants are located. The poisoned air of such locations can not aid the plant in assimilating its food, and the dust and soot clogs up the openings of the leaves. Most



Oaks are excellent shade trees

deciduous trees do fairly well in cities or towns because they renew all their leaves (the breathing and digesting apparatus) every year, and are entirely dormant during the winter months, when the gas and soot of factories is augmented by countless numbers of fires used for heating purposes.

All cities have come to realize, however, that the attractiveness attained by the planting of trees and shrubs is not only a valuable asset, but also that these plants are an absolute necessity for the well-being of its citizens, and efforts along these lines are being made quite universally throughout the State. Such plantings are naturally divided into two classes, the streets and parks. Street planting, especially on business thoroughfares, is very often disappointing; in some cases it should never be attempted, and in others only after special preparation. The air-tight pavements and consequent unfit soil and lack of moisture, and the absence of room for expansion, are all against such planting, but any street having a sidewalk fifteen feet or more wide, or whose total width is above sixty feet from building to building, may well and ought to be planted to trees.

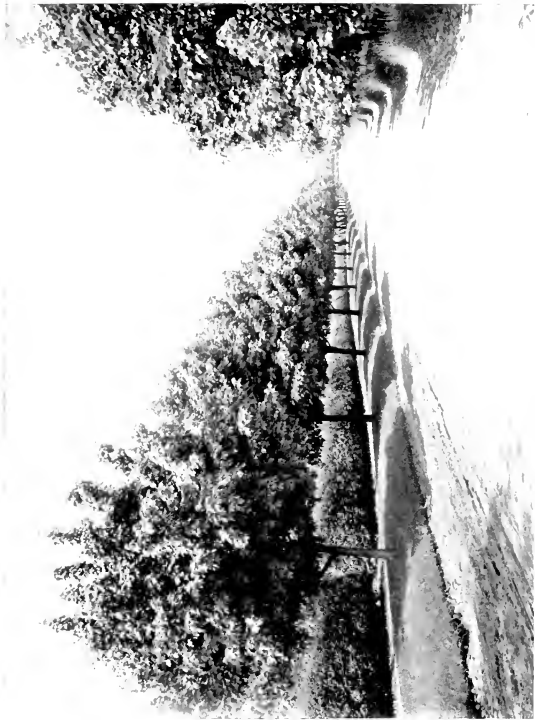
The question as to the most desirable street tree

naturally presents itself, and I think that I am perfectly safe in saying that the consensus of opinion among tree wardens and city foresters in this State is in favor of the Norway maple. This tree is especially in favor for the narrower streets, as its growth is not too rampant and in addition it well endures the omnipresent abuse. Its bright green foliage has few insect enemies and forms a compact round head not easily broken by storms. It would of course be unwise to plant a whole town to this tree, not only because the effect would be monotonous, but also from the fact that an epidemic of a pest favoring this tree would do incalculable harm.

The American elm, the red oak and pin oak, the European plane, the gingko, the white ash, and the European linden are all good, strong trees and should be considered in planning city planting, but in no case should any one street be planted to more than one variety. This has been done, I know, but the effect is always disturbing and has been well described as being like a row of buttons, all monstrously different, on a man's waistcoat. Broad avenues, parkways and promenades are sometimes planted with three or more rows, and when this is done, the center rows may differ from the others with good effect.

Another thing to guard against is the pernicious practice of using such quickly growing and weak trees as poplars, silver maple and box elder. Had I the power I would prohibit the planting of these trees on any city street. The Carolina poplars especially are a great nuisance on account of the habit of penetrating and clogging drains. The smallest crevice in a pipe or a connection will be searched out, and it is simply a question of time before the drain is entirely filled by a great mass of root fibers. I have in mind an occasion which came to my notice only last year, when over twenty feet of vitrified tile sewer thirteen feet under ground had become completely filled with poplar roots. While the box elder and silver maple do not have this same bad habit, they share with the poplar, weak wood of rampant growth, that invites the attack of borers, a propensity for insect pests, and a short life. It is true that they are rapid growers, but too rapid growth is just the thing to be avoided, as the air space in any street is naturally limited.

Especial care must be taken to prepare the soil in the



The Norway maple is one of the most desirable street trees

street. Supply at least three yards of good earth, liberally fertilized with well-rotted manure, and see to it that the drainage system is as nearly perfect as it can be made.

Select trees even in size and character, that have been nursery grown, and that have been frequently transplanted, so that they will have a good mass of fibrous roots near the trunk. Take great care not to let the roots be exposed to sunlight or to winds, as they will dry out and become useless. In planting, fill in the best soil among the roots, and see that every root is surrounded by earth, not packed down upon each other, and have the soil firmly compacted and well soaked with water. A stake driven firmly into the ground, to which the tree can be fastened by means of a wire run through an old piece of garden hose, will keep the tree from swaying and loosening or tearing the tender new rootlets. A tree guard, of which there are hundreds of kinds on the market, should always be used, as otherwise horses or vandals will soon destroy the bark.

The care of a street tree is as important as the planting, and consists largely in shallow cultivation, watering, and in combating the destructive insects, such as elm-leaf beetle, maple scale, bag worm, etc. In places where there is much traffic, it is well to supply an iron grating to cover the earth immediately surrounding the tree, as otherwise the continual tramping will pack the earth so hard that proper aeration and moistening will be impossible. In larger towns and in cities the street trees ought to be placed under the care of an efficient tree warden or arboriculturist, who may be an officer of the department of parks. In some towns a separate shade-tree commission is in charge of all work connected with street trees and this method has usually been very successful.

In public squares and parks of small area, much more latitude may be used in the selection of suitable planting material than in street planting. Many small trees, such as the flowering dogwood, the hornbeam, paulownia, the various hardy magnolias, all hawthorns, the hollies, such evergreens as the Austrian pine, Swiss and stone pine, arborvitae, and the many forms of the Japanese cedars, are most useful, as well as the trees recommended for street use; but the chief ornament of such places should always be the many flowering shrubs, of which mention will be made later.

In the larger public parks there is everything that is hardy and suited to the exposure and soil to be used, as long as too great a mixture is avoided. In order to obtain the best effects, the planning of such parks should always be entrusted to an experienced landscape architect and the subsequent care to a good park superintendent or gardener. In these larger parks may be grown the sweet gum, tulip tree, beeches, white oaks, willows, chestnut, scarlet and black oaks, walnuts, hickories, catalpas, sour gum, and among the conifers, the white pine, red pine, cypress, larch, Norway, oriental, Colorado and Engelmann's spruce, the silver and Douglas spruce. The hemlock and the various cedars may be mentioned as desirable, in addition to those already enumerated. These trees are hardy throughout the State, and while not intended to form a complete list, no mistake will be made in planting any of them.

Nearly all public parks should also be arboretums, to a certain extent, and as such should have first of all a thoroughly representative and well-labeled collection of native trees and shrubs, adding those of foreign origin that are most interesting and beautiful.

In rural communities, the village green and the streets should be well supplied with shade, but to my mind the school ground, which is usually the most neglected as far as ornamentalations are concerned, is the chief place where a carefully selected collection of trees and shrubs should be found. Indigenous flora is usually found very abundant in the country, and for that reason I would give the preference to plants, fruit and flowers of strange character in growth, for these are more apt to attract the interest of the children and call their attention to the wonderful ways in which nature attains its results. It is a great pity that so much less interest is shown toward nature in rural schools than in those in the cities, and indeed in the rural schools of Europe, where the schoolmaster usually is one of the prominent members of the horticultural society of his district.

Regarding the planting of private grounds, I will speak only of those of limited size, as the wealthy usually give the planning of extensive private parks to competent landscape architects. Every householder of consequence has the perfectly natural desire to adorn his grounds in some way, but unfortunately the effect attained is



Hedges can be used effectively

frequently most bizarre and violates the eternal fitness of things. Most often these poor results are the outcome of the desire to have as many kinds of plants as possible, and as a consequence the small front yard is cluttered with trees and bushes in a way that is most unattractive.

One or two trees properly located, and the most desirable shrubs grouped along the edges and filling the corners of a small yard, leaving the center open or nearly so, will present a more pleasing picture than twice the number distributed as mentioned before. Roses in a hedgerow along the dividing line are pleasing, while the same number of plants in a bed in the middle of the front lawn are not, and are decidedly out of place.

Often an owner desires to mark the line of his property along the street, or to obtain a certain amount of privacy. For this purpose a hedge is the very best thing to use if sunlight is not cut off by the street trees. The hedge should be at least fifteen feet distant from large trees as otherwise it will not grow satisfactorily, not only on account of the shade but also because the tree roots absorb too much of the food and moisture. Of plants suitable for hedges I may mention the ibota, California and amure privet, hornbeam, Thunberg's berberis, and

hawthorn, among the deciduous; and arborvitae, hemlock, Japanese cedar, and the Japanese holly, among the evergreen plants. These will all stand shearing well and can be trimmed into almost any desirable shape.

For hedges that are given more room and will be allowed to flower, many of the smaller flowering shrubs, such as spireas, hydrangeas, roses, and *Deutzia gracilis*, are valuable and attractive. These should be pruned carefully to promote flowering, and never sheared into formed shapes. None of the flowering shrubs should be sheared when planted either singly or in groups, as this not only interferes with the production of flowers by removing the young wood, but also changes the naturally graceful shape into something resembling a magnified whiskbroom. A good rule to follow in pruning shrubs is to cut back the fall-flowering ones in the spring, and the spring-flowering ones after they have done blooming. Every other year or so some of the old wood should be removed so that the younger or more vigorous shoots may have a chance to develop. This is called the rejuvenating system of pruning shrubs. Evergreen shrubs like rhododendrons, holly and the evergreen and deciduous azaleas, need very little if any pruning, but it is of great advantage in the case of the azalea and rhodo-



The wild crabapple



Spirea bears flowers in marvelous abundance

variety is so great and their habits so diverse that even a shady corner may be filled with arrowhead, rhododendrons, leucothe, azaleas, maple-leaved viburnum, sweet-pepper bush, and Oregon grape, and a continued bloom may be had from spring until fall, though the greatest wealth of bloom is found in early spring and summer. Early flowering shrubs are flowering almonds, azaleas, rhododendrons, bush honeysuckles, golden bell, red bud, lilacs, followed by white fringe, globe flower, sweet-pepper bush, strawberry shrub, etc. Those flowering in the fall are hydrangea paniculata, rose of Sharon and Desmodium.

Many shrubs are attractive in winter as well,

dendron to remove the seed vessels after the flowers have dropped, so that the strength otherwise consumed by them may go into new growth.

As to the most desirable plants for small, private grounds, much depends on the taste of the planter and the situation; but the trees mentioned for small parks or squares are suitable, with the addition of the more compact evergreens. Trees that will reach a great spread are as much out of place on the small house plot as on a narrow street. Of flowering shrubs, the



The blossoms of the sweet-pepper bush have a delightful, spicy odor

especially those that bear berries that persist until spring. Among these may be mentioned the barberries, burning bush, chokeberry, buckthorn, sumach, snowberries and various roses. Some of these as well as others which carry fruit in the summer, will attract many birds like robins and cedar waxwings. The writer had for several seasons a family of robins around his dwelling during the winter, feeding on rose hips and chokeberries. Other shrubs like the red and yellow branched cornels and the orange-twigged willow, are very useful to lend color to the winter landscape.



Snow berries

So far nothing has been said of the creeping and climbing shrubs, the vines, but since park, garden, or dwelling, is hardly complete without them, they deserve at least honorable mention. They will cover the roughest brick wall, beautify the worst concrete building, clamber over the barest rock, transform the old tree stump into an object of beauty, and will do wonders in hiding the occupant of the front porch from the gaze of the envious. Boston ivy, which comes not from Boston but from Japan, will adhere well to almost any surface except a newly painted



The blossoms of the buttonball bush

board wall, and is especially valuable in cities as neither dust nor soot adheres to its glossy leaves. Its brother, the Virginia creeper, likes trees or trellises better and does excellently in the shade, as does the pipe vine or



The trumpet vine climbing
up an old stump

Dutchman's pipe, whose large green leaves and curious flowers are not seen as often as they should be. Honeysuckles and wistarias will grow almost anywhere and perfume the air and delight the eye with their blossoms. The trumpet vine is excellent for many reasons and has always been of especial interest to me because it will attract the humming birds more than any other plant I know. Wild and cultivated grape are good for arbors and to cover up bare or unsightly places. The Kudzu vine will climb fifty feet in one season, but is rather coarse for small places. Among the roses we have the rambler in its varieties and the prairie roses as climbers, and the various memorial roses as creepers. Clematises from the native virgins bower and Japanese paniculata, which are both good as late bloomers, to the large flowering ones of the jack-

man type, must not be overlooked; and akebia, bitter-sweet, euonymous and several polygonums, are others that are desirable. One word of caution regarding climbers may not be out of place: do not expect too much the first year after planting, as most of them

take some time to become well established, and only the rankest of them like the Kudzu vine will start with a rampant growth at once.

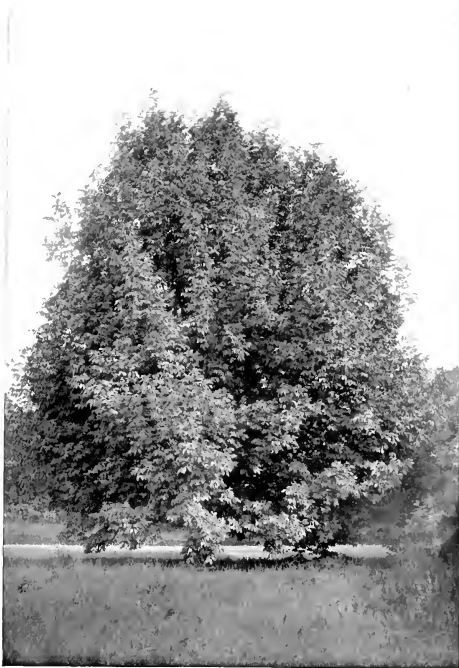
In planting trees and shrubs be careful not to crowd; allow ample room for full development for the individual shape of each for therein lies half the charm of the plant. More harm has been done by planting too much than too little. Many evergreens, for instance, like spruces and firs, grow in width nearly as much as in height, and lose their beauty when they lose their lower branches on account of having been planted too close to a building, walk, road, or to one another. Most of the plants mentioned must of course be purchased in nurseries, but even those who can not afford the expense of these purchases need not despair. There is no section of the State in which many kinds of trees and shrubs do not abound in wood and meadow and may be had for the digging, and while more care will need to be exercised in the transplanting of such collected stock, that very fact will make them more valuable to their owners.

Just one more word to encourage the prospective planter. Beauty is not a luxury but a positive asset. A plot of ground is more valuable when adorned with plants than it is without them, just as a house is more valuable for a coat of paint, and in planting for ornament the planter is not only gratifying his own sense of the beautiful but creating something that will benefit the country at large, and with a trifling expense for upkeep it will increase in beauty from year to year.

HERMANN W. MERKEL
Zoological Park, New York City



Glen Cove High School grounds



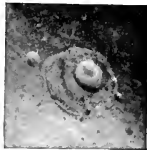
The green ash

INSECT ENEMIES OF TREES AND SHRUBS

MANY insects may be found on ornamental trees and shrubs. Some are beneficial, many comparatively harmless, and a few very injurious. The beneficial insects include the common ladybeetles, sometimes called ladybugs, the brightly colored maggots of certain flower flies, and numerous small or very minute wasps. The maggots of many of these wasps live in caterpillars, and a number find plenty of food in the microscopic eggs of certain insects. The delicate lace-winged fly is interesting and beneficial, since it places its eggs on slender stalks, a position which secures them from the depredations of the greedy young which destroy large numbers of injurious plant lice or aphids.

We may ignore for a time the many harmless insects and study a few of the pests. Every part of a tree may be attacked, including the root, the trunk, the branch, the twig, the leaf, and even the seeds or fruit. The more deadly enemies of trees are found among insects. Some pests, when abundant, may kill trees fifty to one hundred years old within a few months. Thousands of noble shade trees in New York State have been destroyed by insects during the past twenty years. Most of these could have been protected at a moderate cost.

Scale insects are so called because of the waxy, roof-like covering protecting the legless, wingless, eyeless, and almost helpless insects beneath. They are only a little better than pumps attached to a living bag or sack, except for the short time the young scale insects crawl over limbs and foliage before settling and producing the cottony growth, which mats down to form a scale and is soon followed by the loss of legs, antennae or feelers, and eyes. The scurfy scale and the San José scale may be very abundant on the stems and branches of Japanese quince, while the oyster-shell scale thrives best on ash, poplar and lilac. The



San José scale

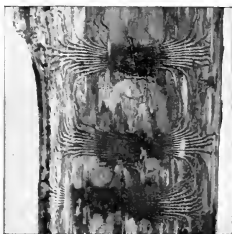
smaller branches of soft maples, especially, may be festooned beneath in midsummer with masses of the cottony maple scale, while the false maple scale produces large, chalky patches on the trunks of hard maples and loose clusters of cotton-covered insects on the leaves. All of these may seriously weaken the infested trees or even destroy them in part at least.



Oyster-shell scale on poplar bark

Most caterpillars feed on leaves. It may surprise many to learn that a few caterpillars have powerful jaws and gnaw wood easily. This is true of the imported leopard moth, the caterpillar of which lives in the trunks, branches, and even twigs of many trees and shrubs. It gnaws large burrows in the living wood and kills or disfigures many trees, especially soft maples in and about New York City. The caterpillars of the similar carpenter worm make large, irregular galleries in hard maple and oak, and the large grub of the sugar maple borer partly girdles branches or even trunks of many fine maples throughout the State. This latter insect ruins or practically destroys many superb maples.

The bark of some trees, especially pine and hickory, is entered by small, brown or black, cylinder-shaped beetles less than a quarter of an inch long. These make small burrows or galleries in the inner bark, while the tiny grubs, hatching from eggs placed on either side of the burrow, do their part



Work of the hickory-bark beetle

in tracing a peculiar design and greatly assist in killing the tree. Thousands of noble hickories have been destroyed in and about New York City by the hickory bark borer during the last five years.

At least one insect devotes itself to pruning off twigs and small branches of various trees. It is called the oak and maple pruner, and its work may be easily known by the wilting tips in late summer and later by the fallen branches, each with a clean-cut end and usually containing the white, legless carpenter grub resting in a burrow in the middle of the twig.

The leaf feeders are known to many. The elm leaf beetle and its voracious grub destroys the foliage of thousands of elms each season, the affected trees showing only brown skeletons of leaves in midsummer. This pest, like a number of our more destructive insects, is small, relatively unattractive and a native of Europe. It has been found that over one-half of the more injurious insects of America have been brought into this country from some other land.

Dainty plumes, like those of the ostrich, delicate tufts or brushes of hairs and brilliant yellow, red and black colors make the caterpillar of the white-marked tussock moth a beautiful object, whether seen with the unaided eye or viewed through a magnifying glass. The male moth has plumed feelers or antennae and thick tufts of hairs on its forelegs, while the poor female is very plain and does not possess even wings. The eggs are placed in a large, white mass on the cocoon and may be easily removed and burned. The spread of this pest is accomplished mostly by the caterpillars crawling from tree to tree and is therefore quite limited. This insect sometimes becomes very abundant and the caterpillars eat almost everything in sight and strip the leaves from horsechestnut, linden, elm and maple trees in cities and villages.

A number of other leaf-eating caterpillars, some very destructive, may be found on trees, and at any time we



Work of the elm leaf beetle

may expect the discovery of the gipsy moth and the brown-tail moth in New York State. These two insects were accidentally brought to this country in recent years and are now widely spread and most injurious in the New England States.

Plant lice or aphids, unlike caterpillars, live upon the sap of plants which they suck through a tiny beak from the living cells in the leaf or even the inner bark of many trees and shrubs. These tiny insects usually occur in great numbers on the leaves and, when numerous, produce a large amount of a sweet, sticky substance known as honeydew. This honeydew smears the leaves and may even wet the ground beneath. Ants frequently protect plant lice and feed upon the honeydew they produce. A sooty fungus grows in the honeydew and



White-marked tussock moth; male on the left and female on the right

blackens the affected foliage. These insects are small and very weak, and yet they often become so abundant as to cause very serious injury because of the large amount of sap they suck from the plants upon which they occur. Sometimes a large part of the foliage of many elms and maples is nearly destroyed by these tiny enemies.

We can not describe here all the insects which feed upon ornamental trees and shrubs. A few are injurious almost every year, while a much larger number may cause serious damage only now and then, long periods sometimes passing before a pest becomes abundant again. A study of insects shows that all produce eggs and from these hatch small maggots, grubs or caterpillars. These latter require a large amount of food, since this is the stage or condition in which insects grow. We should remember that small flies never grow to be large flies.

Following the period of growth there comes a time of apparent rest and change which, with the butterfly, is known as the chrysalis, and finally we have the insect or butterfly itself. A knowledge of these changes is interesting and also valuable, since there is almost always some period in the growth of an insect when its habits make it rather easy to control.



Two-spotted lady beetle

Leaf-feeding caterpillars and grubs may usually be killed by spraying with a poison (such as arsenate of lead which is one of the best poisons), while this would be of no

value for such a pest as bark or twig borers, because the poison can not be placed where the insects must eat it or go hungry. Plant lice, since they suck the fresh sap from the inside of the leaves or the inner or under part of the bark, can not be killed by poisons lying on the surface; fortunately they are very delicate and most of them are easily killed by spraying the insects themselves with a mixture of soap and water. Scale insects, like plant lice, suck the sap from the plant but they are more difficult to kill because they are protected by a waxy scale. We must either use a stronger spray and apply it in winter so as to avoid injuring the plant, or else wait for the time when the tender young are crawling and kill them with a spray such as is used for plant lice. Borers can be destroyed only by putting something into the burrows which will kill the grubs, such as carbon bisulfid, or by cutting and burning the infested parts of the tree.

The habits of insects differ so much that we must know what each pest actually does before we can fight it to the best advantage. The elm leaf beetle and the white-marked tussock moth are both leaf feeders, and yet a tree may be sprayed in such a manner as to kill the caterpillars of the latter and not injure the elm leaf beetle grubs because they feed entirely on the under surface of the leaf and are therefore not affected by a



The peculiar eggs of the lace-winged fly

poison lying upon the upper side of the foliage. The caterpillars of the white-marked tussock moth, on the other hand, eat all the leaf, biting or gnawing out portions between the veins and are therefore easily poisoned if the spray is simply thrown upon the foliage. Certain leaf miners such as the imported elm case-bearer, eat a small hole through the leaf and then feed upon the tender portions lying between the upper and the lower surface and are therefore much more difficult to poison than most leaf feeders. There are a large number of leaf miners, usually not very injurious, which enter the leaf through a minute hole and spend practically their entire existence in the gallery or mine between the two surfaces of the leaf. Some insects, like the hickory bark beetle, pass the winter in the affected wood, and it is then easy to cut and burn the trees which have been attacked and thus kill the borers. We see from these few examples that it is necessary to know what an insect does if we would succeed in preventing injury to the thousands of magnificent trees and shrubs adorning our streets, parks and private grounds.

E. P. FELT

New York State Entomologist



The sugar maple borer





Public school buildings at Hudson Falls

JOHN WALTON SPENCER

“**A**S for myself I am glad that I have learned to know the heart of a child, and that I have lived to see three score and five years.” These were the words of “Uncle John” when he retired from his active work in the nature study bureau of Cornell University five years ago; and perhaps the greatest tribute that may be paid to him is to say that he learned to know the heart of a child.

John Walton Spencer was born at Cherry Valley, N. Y., June 12, 1843. Soon afterward his parents moved to Westfield, Chautauqua county. The district school was where “Uncle John” gained his education, and also gained much of that knowledge of human nature which was such a help to him in his final chosen field. It was granted him to have one term at a select school in the town, and we know that he made the best of this opportunity. On his coming of age came the young man’s desire to see the world and he went west to the Pacific coast. He saw San Francisco in the fever of the war time, when gold was at a premium and gold mining the chief industry of that state. But still he was not satisfied; he shipped with sailing vessels and visited the Sandwich islands, then an independent native kingdom, and remained there for a year and a half. But the home claimed him and he returned to the farm.

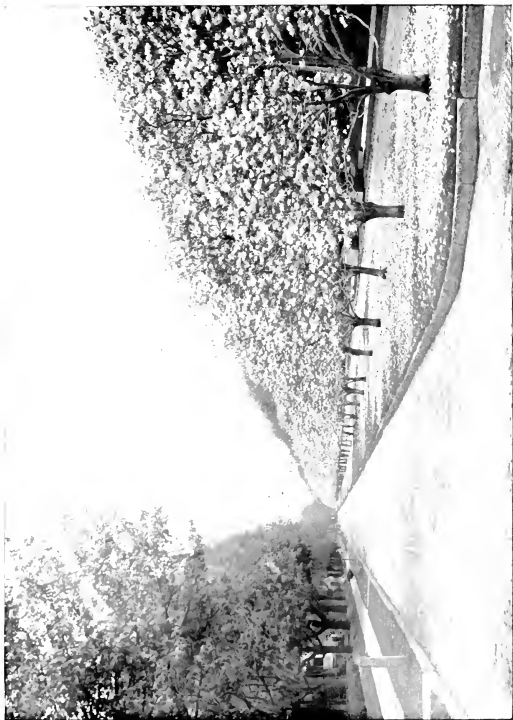
As he struggled with the problems of the farm, the conviction grew upon him that the State was doing too little to educate the farmer in intelligent methods of agriculture. In 1894 through the influence of the Chautauqua Horticultural Society, of which Mr Spencer was chairman, an appropriation was made to Cornell University for promoting the horticultural interests of the western counties of the State. Thus began the Cornell extension teaching. Horticultural schools of several days’ duration were held in Jamestown and in other places, professors from the college conducting the teaching. Mr Spencer was among the most eager and intelligent of those who came to learn. His mind eagerly grasped the scientific

facts and comprehended their value. He saw clearly that to help the farmer the teaching must be of a popular sort, and he must undertake to translate the results of scientific investigation in agriculture into terms which the plainest of farmers might understand. He did this in farmers institutes and wherever opportunity occurred.

In 1896 an appropriation was given to Cornell especially for extension work and "Uncle John" went to the university to help in the work. At first his help was entirely voluntary, but he was found to be of so great use that he was asked to give up his farming for a time and to help with this new work. His first work was as supervisor of the farmers reading courses. Through correspondence "Uncle John" tried to give the farmers in simple terms the information of scientific facts in agriculture. The reading courses reached thousands of practical men.

Another phase of the work interested "Uncle John" still more. When Cornell was given an appropriation to carry nature study into the rural schools of the State, Mr Spencer among many others was asked to visit the schools and note their needs and whether this teaching was being done. Then "Uncle John" found himself in his true element. He instructed not only the teachers but the children during these visits, and came back enthusiastic over the possibilities. He it was who first saw clearly that the first step in this great work was to help the teachers through simple written leaflets.

Not long after this work was undertaken with teachers, "Uncle John" conceived the idea of helping the teachers by getting the pupils interested. He said, "We can not do the work from the top down, we must commence from the bottom and work upward." In confronting this problem his genius first showed its true greatness. He organized all the children under one teacher into a club, known as the Junior Naturalist Club. The pupils were all to pay dues, which consisted in writing letters to "Uncle John" describing their out-of-door observations and activities. After they had done their work well for a time a charter and a button were given. This charter was framed and prized by the children. Since the pupils under one teacher were the unit for the club, there might be as many Junior Naturalist Clubs in one school as there were rooms and teachers. Thus the



An avenue of magnolia trees, Rochester

work grew rapidly. Thousands of children came into these clubs.

"Uncle John's" circular letters to teachers and to his many nieces and nephews were intrinsically delightful. As a writer, he was original and his writings had a literary quality quite their own. Certain professors, in no wise interested in this work in itself, have said that they read everything "Uncle John" wrote because of its literary merit as well as its originality. Certainly his letters went straight to the hearts of children. His was the great power of a great heart that reached out and drew toward him the hearts of the young. "You are the best loved man in the State," said one of his colleagues to "Uncle John" one day, who saw the children gather round him at a picnic, and this was true.

"My slogan has been to give one thing to each of a thousand children rather than a thousand things to one," declared "Uncle John" in a Junior Naturalist Club, and his tenderness and care for the mediocre child was always one of his strongest characteristics. At the flower or vegetable exhibits made by children at the fairs, "Uncle John" would pick out some poor little bouquet and find the owner, and with his word of commendation make him feel that next year he would do better. The children responded to his efforts in a marvelous manner. For several years the number of letters from his nieces and nephews ran up into the thousands, finally attaining one year the number of 30,000. Never was a request from a child willingly neglected, although acknowledgments were made whenever possible through circular letters, which were remarkable because of their personal quality. He not only wrote to the children but he visited their schools and talked with them and always gained their rapt attention. His last work was to organize the children of the State into Junior Gardeners Clubs, very much on the plan of the Junior Naturalists. In this he was as truly successful.

When he retired to Bellwether in 1908, he still kept up his relations with Cornell and did the work of field agent for five years, and to the last his soul was in the work with children. Only a few days before his last illness he gave a lesson to a training class in Chautauqua county, with all of his old enthusiasm, interest, and success. He was always ready to lend a helping hand,



A school playground

and his ideal was to teach so as to help the children to a knowledge of the beauty and use of the common things in their country environment. He once said, "The man who can find comradeship in associating with himself has a fountain of culture; living in a 'hurrah's nest' is enervating. The man or woman to whom folks are necessary is to be pitied." Thus he tried to build up within the child powers for self-development and self-help.

As a friend, "Uncle John" was always most helpful. He was always ready to give a word of cheer in discouragement, and his optimism was a source of inspiration. When he had once made up his mind to accomplish an object, it was amazing to see how obstacles fell before his determination.

"Uncle John" died at Ithaca October 24, 1912, and was buried at Westfield two days later. It seemed fitting that his passing should occur in the place of his greatest achievements. It seemed like the writing by the hand of fate that a farmer in a rural district with no special education to fit him for the work, should have found the opportunity for the full development of his genius, and thus brought his influence to bear upon the

lives of so many thousand people, not only of our own State, but an influence that is truly world-wide

ANNA BOTSFORD COMSTOCK

[Abridged from article in *Cornell Countryman* of November 1912]

THE SONG OF THE THRUSH

When the beech trees are green in the woodlands,
And the thorns are whitened with may,
And the meadow-sweet blows and the yellow gorse blooms
I sit on a wind-waved spray,
And I sing through the livelong day
From the golden dawn till the sunset comes and the shadows of
gloaming grey.

And I sing of the joy of the woodlands,
And the fragrance of wild-wood flowers,
And the song of the trees and the hum of the bees
In the honeysuckle bowers,
And the rustle of showers
And the voice of the west wind calling as through glades and green
branches he scours.

When the sunset glows over the woodlands
More sweet rings my lyrical cry,
With the pain of my yearning to be 'mid the burning
And beautiful colours that lie
'Midst the gold of the sun-down sky,
Where over the purple and crimson and amber the rose-pink
cloud-curls fly.

Sweet, sweet swells my voice thro' the woodlands,
Repetitive, marvellous, rare:
And the song birds cease singing as my music goes ringing
And eddying echoing there,
Now wild and now debonair,
Now fill'd with a tumult of passion that throbs like a pulse in the
hush'd warm air!

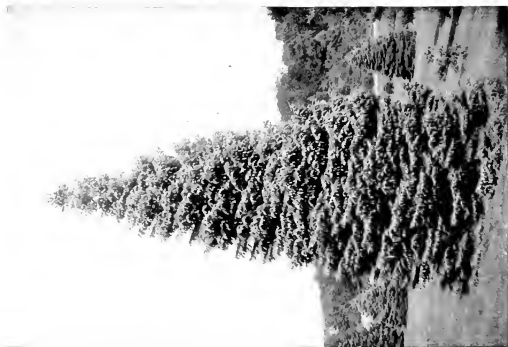
William Sharp

From Songs and Poems

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The German linden tree



Engleman's spruce



Larch



SUGGESTED PROGRAM FOR ARBOR DAY

- 1 Song
- 2 Reading: The Significance of Arbor Day, Arbor Day Annual
- 3 Recitation: Foreign Lands.....*Stevenson*
or
The First Bluebird.....*Riley*
- 4 Essay: Some typical trees of our locality
- 5 Song
- 6 Reading: Selection from "The Planting and Care of Trees for Ornament".....*Hermann W. Merkel*
- 7 Reading: The Friendly Trees.....*Van Dyke*
- 8 Essay: Some practical suggestions as to treatment of school grounds with trees and shrubbery
- 9 Song
- 10 Essay: Sketch of life and work of "Uncle John" Spencer
- 11 Quotations, or selected readings
- 12 Recitation: The Heart of the Tree.....*Bunner*
- 13 Song
- 14 Planting of tree or shrubbery
- 15 Song

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218 School Gardens
468 Forestry in Nature Study
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Canandaigua Academy grounds



IN THE GARDEN

A bird came down the walk:
He did not know I saw;
He bit an angle-worm in halves
And ate the fellow, raw.

And then he drank a dew
From a convenient grass,
And then hopped sidewise to the wall
To let a beetle pass.

He glanced with rapid eyes
That hurried all abroad —
They looked like frightened heads, I thought;
He stirred his velvet head

Like one in danger; cautious,
I offered him a crumb,
And he unrolled his feathers
And rowed him softer home

Than oars divide the ocean,
Too silver for a seam,
Or butterflies, off banks of noon,
Leap, plashless, as they swim.

Emily Dickinson

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THE FRIENDLY TREES

I will sing of the bounty of the big trees,
They are the green tents of the Almighty,
He hath set them up for comfort and for shelter.

Their cords hath he knotted in the earth,
He hath driven their stakes securely,
Their roots take hold of the rocks like iron.

He sendeth into their bodies the sap of life,
They lift themselves lightly toward the heavens,
They rejoice in the broadening of their branches.

Their leaves drink in the sunlight and the air,
They talk softly together when the breeze bloweth,
Their shadow in the noon-day is full of coolness.

The tall palm trees of the plain are rich in fruit,
While the fruit ripeneth the flower unfoldeth,
The beauty of their crown is renewed on high for ever.

The cedars of Lebanon are fed by the snow,
Afar on the mountain they grow like giants,
In their layers of shade a thousand years are sighing.

How fair are the trees that befriend the home of man,
The oak, and the terebinth, and the sycamore,
The broad-leaved fig tree and the delicate silvery olive.

In them the Lord is loving to his little birds,
The linnets and the finches and the nightingales,
They people his pavilions with nests and with music.

The cattle also are very glad of a great tree,
They chew the cud beneath it while the sun is burning,
And there the panting sheep lie down around their shepherd.

He that planteth a tree is a servant of God,
He provideth a kindness for many generations,
And faces that he hath not seen shall bless him.

Lord, when my spirit shall return to thee,
At the foot of a friendly tree let my body be buried,
That this dust may rise and rejoice among the branches.

Henry Van Dyke

From Poems of Henry Van Dyke



A good illustration of planting on school grounds

IN THE MAPLE WOOD

Crimson burn the briar-tips now
As the sky at vesper-vow;
And the sap within the maple
Tingles to the topmost bough.

From its winter-long repose
Wakes the wood; the bonfire glows;
Up and down the leafless arches
Rings the clamor of the crows.

And from early morning-dream,
Freed by the awakening beam,
How the sap into the buckets
Trickles in a silvery stream!

Where the maples thickest throng
Plod the toilers late and long,
While the low voice of the caldron
Sings its ceaseless sugar-song.

Hither when the aisles grow dim
And the pine knots flare and swim,
Comes a group of laughing lasses,
Cheeks aglow and eyes abrim.

Then the merriment has flow,
Quips go darting to and fro,
While the more than honeyed nectar
Turns to sugar in the snow.

And if sweeter things than this
Chance (a surreptitious kiss!)
Where's the man or where's the maiden
Who would count such joy amiss?

For when winter's fetters part,
And the maple juices start,
Then it is, my maids and masters
Stirs the love-tide in the heart!

Clinton Scollard

From *The Lyric Bough*

Used by permission of the author



Pride of Rochester

FOREIGN LANDS

Up into the cherry tree
Who should climb but little me?
I held the trunk with both my hands;
And looked abroad on foreign lands.

I saw the next-door garden lie,
Adorned with flowers, before my eye,
And many pleasant places more
That I had never seen before.

I saw the dimpling river pass
And be the sky's blue looking-glass;
And dusty roads go up and down,
And people tramping into town.

If I could find a higher tree,
Farther and farther I could see,
To where the grown-up river slips
Into the sea among the ships —

To where the roads on either hand
Lead onward into fairyland,
Where all the children dine at five,
And all the playthings are alive.

Robert Louis Stevenson

From Poems and Ballads



The arrow-wood

I HEAR THE WOODLANDS CALLING

I hear the woodlands calling, and their red is like the blare
 Of trumpets in the air,
Where rebel Autumn plants her tents and crowns her gypsy hair.
I hear her beauty calling glad, with crimson and with gold,
 As oft it called of old;
And I must forth and greet her there and clasp her close and hold.
As yesterday, again today, my heart will run to hear,
 The gypsy wanderer,
Through scarlet of the berry-pod and purple of the burr.
The vines that vision forth her cheeks shall tell me where she lies,
 Soft gazing at the skies;
And I will steal upon her dreams and look into her eyes.
The sumach that repeats her lips shall tell me where she smiles,
 Who still my heart beguiles,
And I will speak her face to face and lounge with her for miles.
A riot and a tangle there, a blur of gold and gray;
 She surely went this way —
Or, so it seems, the maples cry, the cloudy asters say.
Oh, I must up and strike the trail, that often I have gone,
 At sunset and at dawn,
Where all the beauty of the world puts all her splendor on.
I hear her bugles on the hills; I see her banners blowing,
 And all her campfires glowing,—
The campfires of her dreams,— and I — I must be up and going.

Madison Carvein

From *The Poet, The Food and the Fairies*

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A VERNAL SONG

Who's with me? Who's with me?
Come, ye lads and lassies!
For the bird is in the tree,
And the south-wind passes,
Making wooing melody
In the leaning grasses!

Every migrant of the earth
Knows the sap runs mellow;
Every thing of roving birth
Feels the spring his fellow;
Up and down, with flooding mirth,
Capers Punchinello.

Wheresoe'er we look abroad,
Lo, the sky caresses!
Cowslips perk and wind-flowers nod
In their dainty dresses;
Gleam upon the woodland sod
Violets and cresses.

Every laneway hath its lure,
Every path its pledges;
There is happiness, be sure,
Hidden in the hedges,
And where rills go purling pure
Down the mossy ledges.

So, since joy is in the land,
Come, ye lads and lassies!
Let us rove, a loving band,
Where the south-wind passes,
Hand in hand, hand in hand,
Through the leaning grasses!

Clinton Scollard

From *The Lyric Bough*

Used by permission of the author

THE HEART OF THE TREE

What does he plant who plants a tree?
He plants the friend of sun and sky;
He plants the flag of breezes free;
The shaft of beauty towering high;
He plants a home to heaven anigh,
For song and mother-croon of bird
In hushed and happy twilight heard —
The treble of heaven's harmony —
These things he plants who plants a tree.

What does he plant who plants a tree?
He plants cool shade and tender rain,
And seed and bud of days to be,
And years that fade and flush again;
He plants the glory of the plain;
He plants the forest's heritage;
The harvest of a coming age;
The joy that unborn eyes shall see —
These things he plants who plants a tree.

What does he plant who plants a tree?
He plants, in sap and leaf and wood,
In love of home and loyalty
And far-cast thought of civic good —
His blessings on the neighborhood,
Who in the hollow of His hand
Holds all the growth of all our land —
A nation's growth from sea to sea
Stirs in his heart who plants a tree.

Henry Clayler Bunner

From *Poems* of H. C. Bunner

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Berries of the hawthorn bush



White birches

THE FIRST BLUEBIRD

Jest rain and snow! and rain again!
And dribble! drip! and blow!
Then snow! and thaw! and slush! and then —
Some more rain and snow!

This morning I was 'most afeard
To *wake* up — when, I jing!
I seen the sun shine out and heerd
The first bluebird of Spring!
Mother she'd raised the winder some;
And in acrost the orchard come,
Soft as a angel's wing,
A breezy, treesy, beesy hum,
Too sweet fer anything!

The winter's shroud was rent a-part —
The sun bust forth in glee,
And when that *that bluebird* sung, my hart
Hopped out o' bed with me!

James Whitcomb Riley

From Neighborly Poems

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A variety of hydrangea

ARBOR DAY LAW

§ 750 Arbor Day. The Friday following the first day of May in each year shall be known as Arbor Day.

§ 751 Manner of observance. It shall be the duty of the authorities of every public school in this State to assemble the pupils in their charge on that day in the school building, or elsewhere, as they may deem proper, and to provide for and conduct, under the general supervision of the city superintendent or the school commissioner or other chief officers having the general oversight of the public schools in each city or district, such exercises as shall tend to encourage the planting, protection and preservation of trees and shrubs, and an acquaintance with the best methods to be adopted to accomplish such results.

§ 752 Prescribed course of exercises. The Commissioner of Education may prescribe from time to time a course of exercises and instruction in the subjects hereinbefore mentioned, which shall be adopted and observed by the public school authorities on Arbor Day. Upon receipt of copies of such course sufficient in number to supply all the schools under their supervision, the school commissioner or city superintendent aforesaid shall promptly provide each of the schools under his charge with a copy, and cause it to be observed.

PLANT A TREE

He who plants a tree
Plants a hope,
Rootlets up through fibers blindly grope;
Leaves unfold into horizons free.
So man's life must climb
From the clods of time
Unto heavens sublime.
Canst thou prophesy, thou little tree,
What the glory of thy boughs shall be?

He who plants a tree
Plants a joy;
Plants a comfort that will never cloy.
Every day a fresh reality,
Beautiful and strong,
To whose shelter throng
Creatures blithe with song.
If thou couldst but know, thou happy tree,
Of the bliss that shall inhabit thee!

He who plants a tree
He plants peace.
Under its green curtains jargons cease;
Leaf and zephyr murmur soothingly;
Shadows soft with sleep
Down tired eyelids creep,
Balm of slumber deep.
Never hast thou dreamed, thou blessed tree,
Of the benediction thou shalt be.

He who plants a tree
He plants youth;
Vigor won for centuries, in sooth;
Life of time, that hints eternity!
Boughs their strength uprear,
New shoots every year
On old growths appear.
Thou shalt teach the ages, sturdy tree,
Youth of soul is immortality.

He who plants a tree
He plants love.
Tents of coolness spreading out above
Wayfarers he may not live to see.
Gifts that grow are best;
Hands that bless are blest;
Plant: Life does the rest!
Heaven and earth help him who plants a tree,
And his work its own reward shall be.

Lucy Larcom



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