On Trees and Shrubery Adapted to the soil and climate of Nashville

by

August Gattinger

ON

TREES AND SHRUBBERY,

ADAPTED TO THE

SOIL AND CLIMATE OF NASHVILLE,

IN RELATION TO

YARDS, STREETS AND PUBLIC PARKS.

BY

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ARBORICULTURE AND HORTICULTURE.

DR. J. D. PLUNKET, *President of the Nashville Board of Health:*

DEAR SIR—In compliance with a request of the Board of Health of this city I have the honor to transmit to you herewith a general treatise on Arboriculture and Horticulture, with reference to the embellishment of this city, and the conditions of our climate and locality.

Yours very respectfully,

A. GATTINGER.

Nashville, September 1, 1878.

The development of artistic taste and a growing sentiment of the Beautiful in Nature, have of late within this community achieved very gratifying results. Modern architecture, embodying the wonderful improvements and comforts of an inventive age with the insuperable models of the classical phases of this art, is rapidly supplanting the dull structures of a bygone unaspiring age. The expanding contact with the world and their growing wealth and prosperity invite the citizens to surround themselves with those luxuries and refinements, which elsewhere adorn long established seats of government and commerce.

Now, since art more than ever before leans with pious devotion upon nature, it becomes of consequence a rational desire to bring in harmonious union the charming aspect of nature with our city and domestic life.

The advantages of this movement are plain. It increases health and cheerfulness, the love of home, and strengthens the patriotism of the citizen.

Public opinion favors propositions in regard to the adornment of the city with parks and avenues, and private enterprise has embellished a great many homesteads with trees and flower-beds in elegant devises. The monotonous, obstructive and at random method of tree planting formerly pursued, gives us now more annoyance than pleasure, and the ubiquitous Paper Mulberry,

with its cumbersome umbrage, and the Ailanthus, with its unpleasant odors, have been unlucky selections for general planting. It is a remarkable and astonishing fact, that men, living in the midst of primeval forests, constituted of the most magnificent trees in the world, had to go on a pilgrimage to the other side of the globe, to the shrines of Buddha and the South-sea Islands, to obtain a pair of trees of no peculiar merits for ornamental planting.

However, we ought to look even upon such errors with a degree of reverence as the first attempts in a prudent and beneficial enterprise. Civilization and culture of plants have been wedded together in all ages of which we possees historical records, and laws and religious ceremonies relative to the culture of cereals and fruit-bearing trees were recognized by the most ancient nations of both continents. A sacred law prohibited the adorers of Osiris to damage fruit trees, and the first commandment in the Zend-Avesta says: "Thou shalt cultivate the field, and plant fruit-bearing trees." The acknowledgment of the great blessings conferred upon man by the arborescent vegetation in support of life and aid in the simple industries, led primarily to the veneration and worship of trees, and this sentiment of reverence advises us to find in it the root and origin of the early rising of a profound sense of the love of nature amongst the Semitic, Indic and Iranic nations. Wherever the mind had matured so as to be able to conceive the beautiful in the aspect of nature and to create the desire to enjoy this pleasure in the fullest measure, there was originated the first artificial plantations. Diodorus describes the gardens laid out by Semiramis at the foot of the mountain Bagistanos. Rows of cypresses, whose obelisk-like form recalls to the mind the shape of flames, stood around the sanctuary of the temple of Zoroaster, and the residences of the Persian kings were surrounded by extensive artificial plantations of great beauty. These ancient Asiatic gardens, "Paradeisoi" of the Greek authors, derive their name from the old Persian "Pardes," and this again descends from the Sanscrit "Paradesa," which means an environ.

I take occasion to make some historical remarks to guard against the acceptance of that hollow phrase, "Modern Civilization," as the originator and distributor of every art and knowledge, thought to elevate and beautify human life.

Admiration of and respect towards the majestic and venerable in Plant-Life, has originated and is still at home in the East, and many confirmatory facts are recorded. Herodotus speaks of the joy of Xerxes when he beheld the great Plantain in Lydia, to which he presented gold and jewels, and gave her an attendant in the person of one of the 10,000 Immortals. Great was, by the Hellenic nations, the fame of the majestic Palm-tree in Delos and an old Plantain in Arcadia. The Buddists in Ceylon are paying their veneration to the colossal Holy Fig-tree of Anurahdepura. He is said to have grown up from the branches of the parent-tree under which Buddha went into Nirvana.

The aspect of Nature, for which the Greeks and Romans had very little conception, took impression at an early day upon the remotest Asiatic nations. Already under the victorious dynasty of the Han (100 A. C.), in China, had parks and pleasure gardens extended over the country in such dimensions, that from the encroachment upon agriculture, the people became alarmed and revolted. A Chinese author of those times has so touchingly and with such clear comprehension laid down the rules for landscape gardening, that a modern artist could not improve upon the principles, although the means and material at disposal have now immensely increased. "What enjoyment," says he, "do you expect to derive from a pleasure-garden? In all centuries men have agreed that plantations ought to compensate man for those amenities, of which the remoteness from a life in the free and unbound natural state, his genuine and loveliest domain, deprives him. The art, therefore, to lay out a garden, consists in the endeavor to render the cheerful picture of an open country, luxuriance of growth, and so to combine it with shade, seclusion and quiet, which will produce upon the senses the illusion of a rural retreat. Diversity, in which the country excels, ought to be effected in the selection of surface, alternation of hills and dales, in rivulets and lakes, covered with aquatic plants. All symmetry is wearisome; ennui and disgust is felt in gardens where every design betrays constraint and artificialness."

Out of this early developed pleasure in the imitation of the physiognomic of nature, proceeded progressively, in the course of centuries, after intervals of mental stagnation, a system of inquiry and investigation into the conditions of diversity of natural objects, which we now call natural philosophy.

This modern or scientific culture has accomplished the beautiful achievement, to enable us, nearly in all places, where inclemency of climate or insufficiency of the soil threaten us with painful privations, to produce artificially, by culture and grouping of native and exotic plants, the charm of landscape and diversified vegetation, which in their fullness and reality, with personal observation, we could otherwise only experience by dangerous and distant travel.

At this time has also been fully demonstrated the powerful influence of vegetation, especially of the forest, on the condition of climate and health. Humidity and fertility of the soil, the quantity and frequency of atmospheric precipitation, are governed by the expanse of forest-covered country. The return of resolved and apparently inert matter into organic circulation, and lastly, conscious existence, is effected principally by the action of roots and foliage, which absorb from the air carbonic oxyd and other gaseous or vaporous products, likewise from the soil as aqueous solutions of very simple or more compound constitution. The chemical changes going on within the tissues of plants effect not only the growth of the same, but maintain the state of the atmosphere and the springs in a condition fit for the existence of animal life. Very strong arguments are in favor of the opinion that the odors and exhalations of certain trees and plants destroy, by oxydation, deleterious gases, or floating organic corpuscles, which would produce malaria or zymotic diseases. Different species of the Eucalyptus family have of late years earned great reputation as disinfectants for malaria regions. This blissful property is thought to be due to the exhalations of their foliage and the enormous absorbtive power of their roots. The interposition of forest, streaks of timber, and even rows of sunflowers, has frequently and in different countries been credited with the demarcation of epidemics.

The permanent injury to the health of cities arises from the deterioration of the soil through the water and air contained and absorbed in it. The ground upon which our dwellings are erected, consists of loosely aggregated gravel, limestone flags and sand, very frequently, and to the disgrace of our city administration, of vast accumulations of debris and street sweepings. Even there, where solid rock forms the foundation, hollows, crevices and de-

pressions are filled with such loose material. In these interstices are contained considerable quantities of air, which even in very compact gravelly soil constitutes one third of its volume. Whenever water penetrates into the soil, it displaces the air, either in part or entirely, and seeps into the depth until it meets an impervious stratum, upon which it flows along until it flows off with the general drainage of the country, or reappears in lower situated springs and wells. The water during this passage carries with it all substances which can either be floated or dissolved; principally organic remains or excretions. The oxygen of the air largely contained in the porous soil, combines with those substances, decomposing them. Hereby are formed large quantities of gaseous substances, like carbonic oxyd and carbonic acid, ammonia, nitric oxyd, hydro-sulphates, and so on. As long as this decomposition is effected completely, little injury can result. The quantity of impurities which the soil neutralizes may sometimes be very great, and depends altogether upon its mineral nature, which is the greatest in clayey soils. Sooner or later a "state of saturation" takes place, and the use of water thus defiled contains the germs of a host of diseases, cholera, dysentery, typhus.

Not less deleterious are the gases arising from such soil, carried upwards by various forces. Solid or liquid substances, by their conversion into gases, expand and occupy much greater volumes; the motion of the wind and the heating of the surface from solar radiation, have the same effect. Such gases are different from those produced by combustion through oxygen, being products of putrid fermentation, and abounding in disease-creating germs. It is evident that covering all surfaces wherever practicable with sods, must greatly counteract or avert these evils.

The unendurable heat of a southern desert-region is proverbial. Every particle of heat radiated upon it by the sun is either accumulating in the soil, reflected or radiated. Surfaces covered with vegetation annihilate heat, so to speak, in proportion to the mass of the vegetation. For, the solar rays in contact with vegetable tissues, are converted into chemical action, and effect thereby the growth of tissue.

Cities are in one sense miniature deserts, and it would be an inappreciable gain to the health and comfort of the citizens, if they would rear climbing and trailing plants in profusion. The

temperature would be lowered in the immediate vicinity in day time, and the radiating walls would not fill by night the interior of houses with smothering heat. Prolonged high temperatures are productive of malignant forms of diseases.

Such vine-covered trellises could be advantageously applied in confined and narrow localities, where trees would obstruct the circulation of the aerial currents, or be otherwise in the way. Windows are very easily kept clear from being overrun from vines, and the free access of air and light into the apartments is not cut off, as is often the case with trees, when they are either planted too close to the house, or if such kinds are chosen which are unsuitable from too large dimensions. Houses too much shaded are surrounded with an atmosphere of stagnant air and are damp and mouldy.

The irregularity of the original plan of this city, the ruggedness of the surface, which presents in many places the naked rock or but a thin coating of soil, make uniformity in planting of trees along streets and avenues utterly impossible. Fifteen feet distance from a wall is the nearest a tree of middle size ought to be planted. Where the pavements are only nine feet wide and the building close up to them, climbers with or without trellis work should exclusively be used. Small courtyards should never contain any trees, but if the enclosing walls are covered over with ivy, which thrives well in shaded situations, it will be pleasant to the eye, and air and light will not be shut out.

However, all the benefit that may result from judicious tree-planting, covering by trellises and sodding of the ground, cannot overcome the miasmatic emanations from adjoining swamps and morasses, nor prevent the ingress of sirocco-like blasts from the neighboring stony heights, south and south-west from the city. The ponds ought to be drained and the desolate hills and wastes covered with suitable growth. Presently wide spaces intervene of open and unshaded ground between the city and the nearest accessible grove or forest. The healthy and harmless pleasure of enjoying a walk in the open air, sheltered against the hot sun and unpleasant winds, or more distant excursions on foot, is not attainable here. Human nature needs and seeks diversity and enjoyment, and if the avenues to legitimate pleasures are closed, the morals and social feelings will become sadly affected.

A number of our citizens will visit the Paris Exposition this year. They will carry home with them unextinguishable impressions of the public spirit that animates the French people. At every step and turn they can see and learn how much happier men live and look with an openhearted and social disposition, compared with those prone to anxious seclusion and rank demarcation. Even religious devotion is not apt to dull with them the gay colors of life, and the pious visitor of the high mass in the Madeleine or Notre Dame, enjoys in the following hours, with equal sincerity the earthly pleasures of the Champs Elysees, Bois de Boulogne and other attractions of this brightest and most beautiful of all cities. In magnificence and number of public gardens and parks, in taste, and means of execution of adornment, the French capital takes the lead. Perhaps the noblest feature of Parisian gardening or Parisian improvements, is the great abundance of healthy young trees that are introduced into the very heart of the city, and planted wherever a new road or boulevard is constructed. It is indeed very surprising to see how well this is done, and to what an extent, as well in the centre of Paris, on the boulevards, along the Seine, as on the scores of miles of suburban boulevards, radiating avenues and roads, the sides of which one would think capable of supplying Paris with building ground for a dozen generations to come. All the planting in all the London parks is as nothing compared to the avenue and boulevard planting in and around Paris. Every tree is trained and pruned so as to form a symmetrical straight-ascending head, with a clean stem. Every tree is protected by a slight cast-iron or stick basket, neat wads and ties preventing this from rubbing against the tree injuriously; it is staked when young, and when old, if necessary. Most important of all, nearly every tree is fortified with a cast-iron grating six feet wide or so, which effectually prevents the ground from becoming hard about the trees in the most frequented thoroughfares, permits of any attention they may require when young, and of abundance of water being quickly absorbed in summer. The expense for these strong and wide gratings must be something immense, but the result more than pays for all the expense by the grateful shade and beauty they afford in all parts of the city. The kinds most in use there for avenues are the Plane, Sycamore, Maple, Chestnut, large-leaved

Elm, the Robinia and Ailanthus, and here and there, Pawlonia. All streets more than twenty-six meters (eighty-five feet) wide, are bordered on each side by rows of trees. If thirty-six meters (one hundred and eighteen feet) wide, there is a double row; and if forty meters (one hundred and fifty feet), there is usually a plateau in the middle, with a carriage way and side walk on each side. The trees are set at least five meters (nearly seventeen feet) from the houses, and they are five meters apart and 1.5 meters from the borders of the walks. The gardens, squares or planted places (besides the four great promenades of the Bois de Boulogne, the Parc de Buttes-Chaumont, the Bois de Vincennes, and the Parc de Montsouris, together amounting to one thousand eight hundred and thirty-five hectares), are seventy-four in number, amounting to fifty-seven hectares.

All operations in horticulture must be carried on in strict accordance with the laws of vegetable growth, or damage and failure will follow. Trees and shrubs for transplanting should be started from the seed. Only certain sports, that have originated in lateral shoots or branches of an otherwise normal growth, make an exception, and can only be preserved and multiplied with the preservation of their sport-character by cuttings; otherwise they would relapse again into the original normal form. Seedlings have to be transplanted once or twice and remain in the nursery, until they have attained a suitable size for permanent planting. The age at which their growth is accomplished varies according to species or kind of tree, three or four years from sowing being the usual length of time required. The cheapest and best way to obtain young trees is, to purchase them in nurseries, where they are reared on an extensive scale. Trees dug up at random in the forest ought positively to be rejected, because their roots are generally too irregular and without the sufficient number of fibrous or working roots. Furthermore, a large proportion of them are so tall that their unproportionate length has to be reduced by topping, whereby the circulation of the sap becomes more or less interrupted, and the tree will never thrive well. Another mistake is the transplanting of too old trees. It takes very particular prepartions in, and close attention after, transplanting in such cases. To trim down the limbs and top and transport them with greatly injured roots, will so much stunt them that they succumb

after a protracted illness, presenting a pitiable aspect while standing. By the respiration carried on in the foliage, the circulation in the cambium, as well as the absorption of food and moisture by the roots, is secured. As soon as the ascent and circulation of sap in and up through the cambium is arrested, then the heat and the winds will dry up and shrivel the cells and spiral vessels in a manner to render them permanently impervious, and the pealing or cracking of the bark and decay follows immediately. Partial decay of the trunk is frequently the cause of the breaking down of trees from high winds.

To prepare the ground for transplanting, a hole ought to be dug about three feet deep and three feet square, if possible a good while before transplanting, to cause the earth thrown up at the side of the pit to become thoroughly loosened from exposure to air and heat or cold. For every tree a stout stake should be ready, either of cedar or oak-heart wood, at least three inches in diameter and ten feet in length. This stake is to be firmly inserted in the bottom of the pit, to the south side and close up to the point where the trunk of the tree is to stand. It being fixed perpendicular, the soil formerly thrown out, must be replaced again nearly or quite to the brim of the pit. On top of the loose soil the roots of the sapling should be carefully spread, and covered with the balance of the thrown up soil. After a turned up sod has been placed over, a good watering should be given. Lastly, the tree is tied to the stake with osier or soft cordage. In all exposed situations a box or basket, of iron or slats, or an envelope with thorns from the osage orange or honey locust, fastened with wire, may be put around for protection.

To secure a regular growth and to prevent the breaking down of limbs or entire trees by storms, judicious trimming is required. It is applicable by all deciduous trees, and in some of the broad-leaved evergreens, but never by the conifers. Whenever performed, the cutting must be done close to the trunk, never leaving a projecting part. Nature has provided in a living tree, for the repair of wounds by the deposit of new wood from around the edges, which gradually closes over the injury, and when wholly united, the annual deposit of wood goes on regularly, as if nothing had occurred to prevent it. A sharp knife or saw should be used, cutting first on the under side to prevent the tearing down of the

bark and wood, when the limb is dropping. When finished, the cutting should be smooth and vertical, and the surface be painted over with thick coal tar. The proper time for trimming and pruning of trees and vines, the grapevine included, is the close of autumn, after all the leaves have fallen; and the season best adapted for transplanting deciduous trees as well as evergreens, is early in the spring, as soon as the frost is out of the ground. Especially by evergreens great care must be taken to transplant them with a good ball of earth, and to avoid the loosening, breaking and drying of the fine rootlets.

The climbing or trailing vines do either possess proper organs for direct attachment on smooth surfaces, or depend on some sort of suitable support for the attachment of tendrils or twining stems. For the latter kinds, a spalier of lattice work or wire trellises are employed. The stretching of galvanized wire on walls is the cheapest and neatest looking method. In the first instance, several strong iron spikes are driven into the wall at the ends—in the right angle formed by the two walls, and then rough nails or rather hooks are driven into the wall in straight lines, exactly in the line of direction in which the wire is wanted to pass. The wires are placed at about ten inches apart on the walls, and the little hooks for their support are placed at about ten feet apart along each wire. The wire—about as thick as strong twine—is passed through the little hooks, fastened at both ends of the wall, into the strong iron nails, and then stretched as tight as possible. Their distance from the wall should be about one inch.

To answer the question, what trees, shrubs or ornamental plants to select, an acquaintance with the natural growth or flora of the region must precede, and the results of experiments with imported plants awaited or noted. To discuss the relative merits of all the material that could possibly be adduced, would require volumes. Happily nature has so lavishly endowed this region, that we could fare no better by traveling great distances, than by confining ourselves to the immediate vicinity. The composition of the soil and configuration of surface are sufficiently diversified to insure a great diversity of vegetation to select from. The moist and shady banks of the river, the hot and airy limestone flats with a thin coat of earth, alternating with fertile, deep and loamy soil, formerly heavy timbered, and high ridges coped with sili-

ceous and shistaceous rocks, each possesses their peculiar assembly of plants. The area of the City itself retains only few native old trees, remains and witnesses of the pioneer age. A few Cedars, Hackberries, Elms, Honey Locusts and Poplars. The number of trees planted and now within the city boundaries, estimated at medium growth, would fully suffice for shade and shelter and absorbers of moisture, etc., provided they were properly distributed; but there is great lack in arrangement, and the selection is not from the best kinds.

SELECTION OF TREES AND PLANTS.

The selection of trees for street, garden or park ought never to be entrusted to the recommendations of nurserymen, or be governed by offerings of good bargains. Purchasing unsuitable or unhealthy specimens, one loses not only money but also time. Foremost, the size which a given species will attain at full growth, ought to be considered. Sycamores and Tulip trees would be out of all proportion in streets and avenues less than one hundred feet wide. Very desirable properties are a clean and smooth trunk, regular division of branches, and a spherical or conical outline of crown. Roots horizontal, not too much prone to suckering. Wood strong and elastic, especially in the branches; foliage abundant, the leaves smooth and not too large. Evergreen, broad-leaved trees, wherever they can be grown and maintained, deserve preference; next, those deciduous trees which hold their foliage the longest.

The flora of this immediate vicinity excels in an array of the most desirable trees for street and park planting. For adornment of gardens and parks, the intermixture of such forms which do not occur in the local flora, and are of striking aspect from grotesqueness of shape or diversity in coloring—is exceedingly effective. Such plants, when derived from sub-tropical climates, will, in favorable locations and with protection, frequently endure our winters.

Some interchange and dissemination of vegetable productions between remote regions did nearly always exist, along the highways of commerce and conquest; but, not more than about two hundred years ago did the importation of plants into the gardens and parks of the civilized nations assume any importance. Wher-

ever European Governments held territory in tropical countries and established Colonies, there they also planted for the production of colonial goods. Peruvian Cinchona in India, Abyssinian Coffee in Brazil, Oranges from Portugal in Florida. Several of the German States, where the culture and control of forests is in the hands of the government, do already possess extensive plantations of the *Sequoia Sempervirens*, or Mammoth tree of the California coast, and of the *Sequoia Gigantea*, or Giant Redwood of the Sierra Nevada, of which they had several thousand dollars' worth of seed imported some thirty or forty years ago. With equal success has the European larch been grown in the Northern States, and it thrives there as well as in the German Alps or in Scotland. Its timber is far superior to the American species, and said to make the best railroad ties; larch plantations are considered very profitable investments. To give the public and the student an opportunity to study the characteristics of vegetation, botanical gardens, and for trees exclusively, arboreta, have to be established. The latter ought to contain collections of trees from all parts of the world, which are known or expected to endure the climate of the place. The gardens and grounds of the Agricultural Department in Washington have the greatest extent of their area converted into such an *arboretum*. One of the largest and finest collections of this kind in the United States, constitutes one department of the Missouri botanical garden, and is the property of a wealthy citizen of St. Louis, Mr. Henry Shaw. These grounds are situated about two miles south-west of Lafayette park in that city, and are probably unsurpassed by any in the United States, either public or private, in their extent, their beauty, the completeness of collection of plants, shrubs, and trees, or the skillful cultivation and the lavish expense bestowed upon them. Open to the public, they are a great aid to the advancement of science, the instruction of the student, and the use of the naturalist and philosopher.

The first botanical garden in America was laid out by John Bartram, the father of American Botany, on the banks of the Schuylkill, near Philadelphia, more than a century ago. Of Public Pleasure Grounds, Central Park in New York City, and Fairmount Park in Philadelphia, have acquired great reputation as examples of the greatest perfection in the art of Landscape-Gardening.

After the preceding general remarks on tree-planting in streets and parks, it remains to enumerate and describe some species which, in every respect, appear to me the most worthy and promising for planting in the streets of the city. Landscape or park plantations admit of such a diversity of species that it is impossible even to mention their names within the scope of a small treatise. I will also name a few sub-tropical plants which have given satisfaction in this place, and some native and foreign flowering plants suitable for flower beds; next, the vines and climbers for trelliswork.

Not without much deliberation, and under the impression of very recent observations on a botanical tour through the middle and eastern parts of this State, I have come to the conclusion that for street planting

THE WATER OAK (*Quercus aquatica, Catesb.*) deserves preference before all other trees I am acquainted with, native as well as foreign. It is an *Evergreen* of medium size, not exceeding thirty or thirty-five feet in height, and twelve to eighteen inches in diameter in full growth. Leaves of an olive-green color, short-petioled, obovate-oblong or wedge-shaped, smooth on both sides, obtusely three-lobed at the summit. Acorns small, sessile. It grows not only on the edge of streams and in swamps, whence its name originates, but also very vigorously on dry and elevated grounds, where I have found it myself. It abounds, always intermingled with other trees, in some parts of this State. It is found about Stephenson, Chattanooga, Ocoee district. Moreover, we are not without a precedent of the successful introduction of this species for street planting. The city of Tuscaloosa, Alabama, is sometimes called the city of oaks, on account of the fine avenues of the water oak planted in a central line and along the sides of the streets. On the northern limits of its range it becomes deciduous, and also in severe winters in this place.

THE WILLOW OAK (*Quercus Phellos L.*) grows in similar localities, and even associated with the water oak; it grows about the same size, or a little larger, and has a clean and smooth bark. Leaves, two to three inches long, lanceolate or linear-lanceolate, bristle-awned, smooth and light-green on both sides; fruit small and sessil. An elegant tree, desirable for its distinct willow-like aspect. The foliage of both these species being rather small, and

the spray very elastic, they are not endangered from heavy winds or snowfalls like the evergreen magnolia. It is evergreen south.

Of other oaks only the Live Oak (*Quercus virens, Ait.*) and the Upland Willow Oak (*Quercus cinerea, Michx.*), the former evergreen, are worth considering, but of doubtful success.

Next to the oak, the symbol of strength and valor, stands the Elm for gracefulness and elegance. The elm is one of the most common trees in both continents, and in the south of Europe elms are planted in vineyards, and the vines trained in festoons from tree to tree in the most picturesque manner. Their ramification terminates in light and dark and very copious sprigs, frequently bending down in graceful curves. The oldest American avenues are planted in elms. The vicinity of Nashville abounds in elms, of which four species are represented.

The American or White Elm (*Ulmus Americana, L.*) buds and branchlets glabrous, leaves oval, three to four inches long, sharply and often doubly serrate, flowers in close fascicles. Found in greatest perfection in moist woods, with deep rich soil, where it attains a height of eighty feet.

The Corky White Elm. (*U. racemosa, Thomas.*) Bud-scales downy, ciliate, and somewhat pubescent, as are the young branchlets; branches often with corky ridges; flowers racemed.

Wahoo, or Winged Elm. (*U. alata, Michx.*) Grows here to great perfection, and is easily known by its corky-winged branches; leaves downy beneath, ovate-oblong, acute, tickish, small, one to two and a half inches long, deep green and shining. Height, thirty to forty feet, with very delicate ramifications, light and airy; it does not make a deep shade. The Slippery Elm (*U. fulva Michx*) is perhaps less eligible.

The Hackberry. (*Celtis occidentalis, L.*, and *Celtis Mississippiensis, Bosc.*) These are both very common trees in this region, and numbers of specimens that have been spared have grown from self-sown seedlings to large dimensions. It seems to thrive very well in stony and open localities, and is not injured by dust and smoke. In picturesqueness it is about equal to the elm.

The Lime or Linden Tree. (*Tilia Americana, L.* and *Tilia heterophylla, Vent.*) The latter is common in the Nashville flora. These trees are well known by the name of basswood. It is a rapidly growing, handsome, and regularly shaped tree. In Eu-

rope they have since centuries been favorites for planting in public places. In Germany and Holland especially their wide avenues and long lines of canals are bordered with lindens. "Under den Linden" in Berlin is the most celebrated avenue in the world. This tree is also distinguished by simple but handsome flowers, that last a long time, and diffuse a delicious perfume. The honey gathered from its flowers is very highly esteemed. The flowers, collected with bracts and peduncles, when dried, yield a very pleasant tea, which produces diaphoresis without vascular or nervous excitement. The addition of lemon juice makes it very palatable.

The Kentucky Coffee Tree. (*Gymnocladus Canadensis*) This remarkable tree wins the amplest admiration from everybody who meets it the first time on the outskirts of a forest, where it finds room for the development of its branches. The whole leaf, doubly compound, is generally three feet long, the leaflts standing vertically. It belongs to the order of the Leguminosae, and its flowers are either dioecious or polygamous, whitish, in axillary racemes, fragrant. The pods are six to ten inches long, two inches broad, and the seeds over half inch across. It requires judicious pruning while young, to prevent the breaking down of the young limbs from violent storms. It is indigenous round Nashville.

The Maples, I think, come next. They are held everywhere in great esteem as ornamental trees, their merits consisting in the rapidity of their growth, the beauty of their form, and the verdure of their foliage, to which is added by some the elegance of their blossoms.

The Red Maple, also called Swamp Maple (*Acer rubrum, L.*), is decidedly the most ornamental and of more suitable size, as the other two southern species grow rather too large. In spring this tree bursts out in gay tufts of red blossoms, which give life and color to the landscape, when the only other appearances of vegetation are a few catkins of willows and poplars. It is very prolific in foliage, and gives an ample and abundant shade. The verdure of its vernal clothing is wonderfully contrasted by the golden and scarlet hues of the matured foliage in autumn.

The Box Elder (*Negundo aceroides, Moench*), also called Ash-leaved Maple, has only lately been botanically distinguished from the maples. Linnaeus named it Acer Negundo. It is, on uplands,

a middle-sized tree, but on the river banks it grows to considerable dimensions. Unlike the rest of the maples, it has pinnate leaves, with three or five leaflets; male and female flowers are borne on different trees, as in the persimmon (*dioecious*). It is a very hardy and durable tree, retaining its pendant racemes of of seeds during the whole summer. It is very frequent in this neighborhood.

THE YELLOW-WOOD. (*Cladrastis tinctoria, Raf.*) Next to the coffee tree, the most beautiful of the papilionaceous family. It grows, when standing single, more into lateral expansion, and I have measured a specimen on Judge Lea's lands which, by over three feet diameter of trunk, was little more than thirty feet high. It bears nearly smooth pinnate leaves of seven to eleven oval leaflets, and ample panicled racemes of showy white flowers, drooping from the end of the branches. The wood is yellow and the bark gray, shining and very smooth. It is very remarkable for its prolixity in budding, eyes and shoots bursting forth from all points of trunk and roots. I consider it as fine a tree as the common locust, which it resembles, and the latter is generally not a healthy tree in city localities.

Some species of the ash, like the red ash (*Fraxinus, pubescens Lam.*), and the green ash (*Fraxinus viridis, Michx.*), both produced in this State, are very desirable trees, of moderate proportions, pleasing structure of ramifications and foliage, and more adapted to our purposes than the Ailanthus.

THE PRIDE OF INDIA (*Melia Azederach, L.*), has been much neglected of late, and it is nearly disappearing. It must be remembered that this region forms nearly the northern limit of its range, and although it attains full growth, and is hardly ever killed by frost, yet it does not attain a higher age than about thirty or forty years, when it begins to decay.

The Pride of India rises to the height of thirty or forty feet, with a diameter of fifteen or twenty inches, but when standing single it grows more in lateral expansion. Its leaves are of a dark green color, large, double pinnate, and composed of smooth, acuminate, denticulate leaflets. It has been at a very early day introduced into the Carolinas and the West Indies, where it now abounds.

The reverse position is held by the Lombardy Poplar (*Populus*

fastigiata), which, in cooler climates, is an excellent tree for avenues, and attains a height of eighty and more feet by three feet diameter. But even there this tree does not attain a higher age than forty to sixty years, longevity not being given to the order of the *Salicineae*, to which it belongs. They excel in rapidity of growth. Whosoever chooses to plant this tree must be ready for constant replanting as soon as it shows signs of decay.

THE CATALPA. (*Catalpa bignonioides, Walt.*) A well known beautiful tree, covered in beginning of summer with large racemes of gorgeous white flowers—is not fitted for street planting. It far excells in beauty the common horse-chestnut (*Aesculus Hippocastanum, L.*), whose leaves will become scorched and prematurely drop from the heat of our summers.

THE PAULOWNIA is a very decorative species for certain select localities, but for various reasons it is one of the least-adapted for street planting.

The species now following are those which have formerly nearly exclusively been planted in this city. For this reason I intend to devote to them a more ample description.

THE PAPER MULBERRY (*Broussonetia papyrifera*) has been introduced into Nashville some forty years ago, contemporaneous with the White mulberry (*Morus alba*), the Morus multicaulis and the Heaven tree (*Ailanthus glandulosa*). An attempt was then made to raise silk, and these plants were intended and cultivated for the sake of supplying food for the silkworms. The silk culture failed, being, as I think, more a hobby and transient excitement than the serious enterprise of an industrious class of people resolved to establish this industry for a profitable support.

The Broussonetia is a dioecious plant, which means to say that it has distinct male and female flowers, produced on separate trees, the males being in cylindrical drooping catkins, each flower growing from the base of a small bract, and having a four-parted calyx and four stamens, while the females are congregated into round heads or balls about the size of marbles, which, in ripening, are converted into deep scarlet pulpy fruits, resembling a mulberry, of a sweetish insipid taste. We possess of this, and likewise of the weeping willow, only the male tree. It grows wild in China and Japan, and also in many of the islands of the Pacific Ocean. The Chinese and Japanese cultivate it very much in the way we

do osiers, using only the young shoots for the manufacture of paper from its finely fibrous inner bark. At the Centennial Exhibition such paper and papier-mache articles were greatly admired. The process of manufacture is unknown as a practical art in Europe and America. From no other kind of pulp can so elastic and delicate a tissue be made. It is preferred for the impressions of valuable steel engravings.

In Samoa, Tahiti, and other Polynesian islands, the natives manufacture from the inner bark an exceedingly tough cloth called tapa, and wear it either plain or dyed, and printed in various colors. This cloth is principally made by women, pursuing the following method: The bark is first soaked in water, and the exterior green parts are scraped off, and after a second soaking in water it is placed upon a table made of very hard wood. Upon this it is beaten with a heavy curious-shaped baton, which has four flat sides, each differently ribbed. After the pieces have attained the desired degree of softness, mucilage of arrow-root is applied at their edges, and the hammering and warping continued until the edges firmly cohere. In this way pieces are made which sometimes measure one hundred and fifty feet in length by six to nine feet in width.

The *Broussonetia* promises to grow here to considerable dimensions. It is healthy and vigorous, and possesses a remarkable power of surviving and resisting sustained injuries. It is a great mistake to condemn this tree for its far-reaching roots, which enable it to thrive and resist the fury of a storm when standing on shallow and rocky places. It is, in my opinion, the best adapted tree to replant the sterile hills around the city. It ought not to stand in crowded parks and narrow places. Insects do not often attack it, but a parasitic fungus (*peziza*), as large as a rice grain, often covers the trunk with yellow dots without injuring it.

The Heaven Tree. (*Ailanthus glandulosa.*) Native of China and India, growing to an altitude of one hundred and fifty to two hundred feet. Young and luxuriantly grown, and terminated by a simple crown, it bears a striking resemblance to an arborescent fern or palm. This elegant and graceful form may be preserved on the growing tree by annually lopping off the lateral branches, whereby the main trunk will ascend perpendicularly, and sustain a symmetrical spreading canopy. The pinnate leaves are fre-

quently three feet long, consisting of four to twenty pairs of leaflets. It bears separately male and female flowers on different trees. The male and early deciduous flowers emit a very disagreeable odor, which is carried to considerable distances, affecting many persons with vertigo, headaches, and vomiting, and it is therefore advisable not to plant the male tree at all. The female tree bears large clusters of winged seeds, resembling those of the ash, of a golden color when ripe. They remain a long time upon the branches, add greatly to the beauty of the tree, and have no peculiar smell. The wood of the Ailanthus is exceedingly valuable, its tenacity being superior to the best oak, and when well seasoned, equal to the best timber for posts and ties, resisting for indefinite time changes of dryness and moisture. Insects never disturb it, but nevertheless it is the habitation of the Attacus cynthia, or Japanese silkworm. The rearing of this silkworm has well succeeded in France, where it is carried on in the open air. The roots spread and sprout in all directions, more so than the paper mulberry, and are a great nuisance about cultivated ground. On the other hand, this property has been turned to great profit on the sand dunes of Holland. Associated with the *Broussonetia*, it would, in a few years, cover with dense shade the barren and sterile places where no other trees could make a stand.

The Silver Maple (*Acer dasycarpum, Ehrh*) is now generally preferred for street planting. The foliage is sharply three to five lobed, and white on the lower surface. Its rapid growth is very commendable, and its shape very good until it gets old, when the limbs become bulky and make the tree look very much like a sycamore. Many very large specimens line the banks of the Cumberland above the city. Unfortunately, it is much attacked by various insects, and the trunks are frequently blistered and full of decaying spots, which renders it liable to severe injuries from strong winds. It is a very good shade tree, but certainly far less valuable than the Elm for street planting.

The Locust. (*Robinia Pseudo-Acacia, L.*) This tree grows spontaneously over the whole State, preferring northern hill slopes with rich soil. As long as young and vigorously growing, it makes a good looking tree, but in none but very favored situations will it reach a higher age than about twenty or twenty-five years

without becoming stunted and gradually decaying. In deep loamy river soil, with plenty of moisture, as you may observe on the White's creek pike west of Edgefield, it attains a much higher age in full vigor, and grows in large dimensions with a height of perhaps seventy feet. It is, for the above reasons, not a good species for this city.

Climbing plants ought to find a very diversified application from the multitude of very distinct forms and the manifold devices to which they may be subservient. Some produce luscious fruit, some aromatic spices or wholesome vegetables. Climbing plants are sufficiently numerous to form a conspicuous feature in the vegetable kingdom, more especially in tropical forests. Nearly two-thirds of all the phaenogamic families contribute to this form of vegetable growth, and to these a few cryptogamic plants must be added. Our Climbing Fern (*Lygodium palmatum, Swartz*) is one of the few trailing ferns. Physiologically considered, we may say that, especially the more highly developed tendril bearers, act with some kind of determination or some degree of will and reason very difficult to the human mind to form a satisfactory conception of. The various kinds of movement which they display in manifest relation to their wants, for which the most different organs, stems, branches, flower peduncles, petioles, leaflets, and apparently ærial roots, are all endowed with the same power, impress upon us much reflection.

Climbing plants may be divided into four classes. First, those which wind spirally round a support, and are not aided by any other movement. Secondly, those endowed with irritable organs, which, when they touch any object, clasp it, such organs consisting of modified leaves, branches, or flower peduncles. The third class ascends by the aid of hooks, and those of the fourth by rootlets.

A few of the most important, fully sufficient for our wants, I let herewith follow in the order of their merits.

The Grape Vine (*Vitis Labrusca*) unquestionably takes the lead. It ought to be the first plant that any one thinks about who intends to plant a vine. It possesses an historical and political title to this honor from the high antiquity of its culture, and its universal distribution amongst the most civilized nations. A liberal distribution of grape vines through the city and environs would

also greatly aid the interests of grape culture, from the fact that a great diversity of varieties may then be kept under close observation and easy comparison. The grape vine requires trellises of laths or wire to ascend on walls. Its mode of culture is an object that requires particular study.

The European Ivy (*Hedera Helix, Lin.*) is perhaps the finest looking of all climbers (properly creepers). It ascends by means of little rootlets, by which it fastens itself to stones, or the bark of trees. It possesses not only a glossy dark green cordate and three-lobed foliage in great abundance, but the foliage is also evergreen, a property very rare amongst climbers. After attaining some age it bears umbels of yellowish green flowers, which are followed by black berries. It ought not to be grown on wooden buildings, for it causes them to decay, but on stone buildings it fastens itself firmly without injury to stone or cement. The thick garniture of foliage with which it covers the surface excludes the stormy weather, and has, therefore, a tendency to preserve the walls rather than injure them. It may attain to an age of hundreds of years, and grow to immense dimensions. It serves excellently to subdue the nakedness and openness of the monotonous garden railings by densely covering the railings, which makes a beautiful wall of polished green, so that even in the midst of winter it is refreshing to walk along them. It forms beautiful edgings along walks and around flower beds when planted pretty thickly, tucked down and kept neatly to a breadth of, say, from one foot to twenty inches, so as to form a mass of the freshest verdure, especially in early summer, and, of course, all through the winter in a darker state. Ivy is readily propagated in the open air by making cuttings of about four inches in length, and inserting them in well prepared ground close up to one another. This is best done in September, and if covered over with straw during winter, they will be well rooted and ready for transplanting in early spring. They must be thickly planted for good effect in edgings, say about six or eight inches apart in every direction. A border of eighteen inches breadth requires thus about fifteen plants for the running yard. The scarlet geranium, encircled with an edging of ivy, produces a capital effect. It may also be used with the best taste in the dry air of rooms, and cover over walls and trellises, when planted in a tube. The ivy is not a na-

tive of this country, but of the milder regions of Europe. Of the very numerous species of climbers of our flora is especially one noted for its luxuriance of growth and beauty of foliage. I refer to the

Virginia Creeper (*Ampelopsis quinquefolia, Michx.*), a common woody vine, growing in low or rich ground, attaching itself by rootlets as well as by its disk-bearing tendrils. The leaves are digitate, with five lanceolate slightly serrate leaflets. The greenish flowers, appearing in July, are followed by small blue berries in October. Although the leaves are not evergreen like those of the ivy, yet in autumn they far surpass that plant by the brilliant coloring which they then assume. The ramified tendrils, when they meet with a flat surface of wood or wall (and this is evidently what they are adapted for), turn all their branches toward it, and, spreading them widely apart, bring their hooked tips laterally into contact with it. In the course of about two days after a tendril has arranged its branches so as to press on any surface—to effect which suitably, the several branches, after touching the surface, often rise up, place themselves in a new position, and again come down in contact with it—the curved tips swell, become bright red, and form on their under sides the well-known little disks or cushions with which they adhere firmly. Another species of Ampelopsis—

Ampelopsis Veitshii, which has of late years been much disseminated by commercial gardeners in Europe as well as in America, is well deserving the high recommendations which are given to it everywhere. I am at present not fully informed about the origin of this plant, but believe it to be a denizen of the southern part of the Rocky Mountains. It attaches itself much closer to the surface it adheres to than either the ivy or Virginia creeper, and fastens itself solely by the aid of adhesive disks, and no fear need to be had, therefore, that it may in any way injure the walls. The leaves of young shoots are oval and acuminate; those of second year wood are larger, two and a half or three inches long, round oval, three-lobed at the apex and coarsely serrate; small racemes of berries are abundantly produced in nearly sessil clusters. The foliage is deciduous, and the plant suffers sometimes, at least the young shoots, from late frosts.

These four climbers I consider the best suited for exposures to-

ward streets, yards, and coverings over fences and outhouses. Flower-bearing climbers will be mentioned in the chapter on city gardens.

It is in the interest of town improvement that I intend to make some remarks about the small private gardens within the city boundaries, whose careful management and graceful arrangement add to our feeling of peace, comfort and repose. Wherever the space is very much confined, a clean sod, with an occasional small evergreen, is preferable; but whenever a sufficient expanse of ground is allotted, there it becomes desirable to introduce such plants which, for an entire season, present an aspect peculiar by a distinguished and fine form of foliage, and a choice of such flowering plants as abound in a permanent and brilliant inflorescence. Those of the first class are generally classed as sub-tropical plants, while the latter are not drawn from any particular geographical region.

Selections of plants for flower gardens ought to be left to the desires of the owner. Practice and experience are generally the only guides accepted, still it may not be amiss to communicate the result of experiments, for which I had to pay myself. From these, and the success and failure of others, I will mention a few unquestionably well-adapted and indispensable plants.

Caladium esculentum, in any rich and moist ground. Magnificent specimens of it here and there.

Cannas, in like localities, remote from trees or their roots, such as *Premises de Niece*, *Marshall Valliant*, *Imperator*, etc.

Ricinus communis (the Castor oil plant), when well grown, and of a good variety. It makes a very imposing subject.

One or the other of the palms, such as are easy to house in the winter.

Chamerops Palmetto succeeds excellently, and is very hardy. May stand in the open air until November, and sometimes later.

Pritchardia Filamentosa, Windell. (California Palm.) This palm has been in cultivation to some extent for several years, both in Europe and in this country, under the name of *Brahea filamentosa*. It grows on rocky canons near San Felipe, some seventy-five miles north-east of San Diego. It grows to the height of fifty feet. It is the most northerly growing of all palms—(about the latitude of Memphis.) It has not yet been

tried here, but is very deserving to be fairly tested, as it may perhaps, with very careful protection, stand out the whole winter.

Althea Rosea, the Hollyhock, a much-neglected biennial, when raised from good seeds of double flowers, makes a grand display. After it has passed flowering it should be pulled up immediately with the root, and something else put in its place, as it now looks ragged, and will soon die off.

The Tritomas. So hardy, so magnificent in coloring, and so fine and pointed in form are these plants, that we can no more dispense with their use in the garden where beauty of form as well as beauty of color is to prevail, than we can with the

Pampas Grass (*Gynerium argenteum*), from the prairies of South America. To give it the highest degree of strength and vigor, the soil must be made very rich to a depth of fully four feet. Some straw and a low shed of boards covering it over and keeping excessive moisture from it during winter, is all required to keep it over winter. If it never would put forth its graceful silvery plumes, waving high in the air, the copious pendant rustling foliage alone would make it attractive.

Arundo Donax Versicolor, the Italian striped cane, is another wonderfully effective and beautiful grass that is hardly known in our gardens. It is so elegant in form and delicate in coloring that everybody is delighted in looking at it. It is very easy propagated by laying the mature canes horizontally in the ground in October or November, and covering them over with four to six inches of soil. Beginning of April every node of the cane will have made roots and a new shoot. It is perfectly hardy without protection. The same holds good of the *Erianthus Ravennae*, another tall-growing grass with plume-like tassels, which is much in request for vases.

The Oleander (*Nerium Oleander*), a native of the classical grounds of Asia Minor and the southern shores of the Mediterranean. Much too little use is made here of this exquisite and continually flowering plant. It becomes especially valuable and showy when allowed to grow to the size of little trees from six to twelve feet high, the stem well supported by a stout stake. It ought to be sunk in the ground when planted out, for when in boxes standing on the ground it will be injured from blowing down by heavy winds, as the heads of this plant make very strong

growth during one season. It is necessary to put them into a half flour barrel or cheap wooden box in planting, and have these perforated with numerous holes. This is required to be able to get them up in fall for wintering without great injury to the ball of earth and roots. Such plants carefully lifted up with the sacrifice of the box or barrel, if put in a dry cellar upright, or horizontally, will be in very good condition next spring.

ERYTHRINA CRISTA GALLI. The Coral plant may be raised from seed, and grows and blooms beautiful during our hot summers. It makes large racemes of handsome peashaped crimson flowers, and blooms repeatedly and in profusion. It attains a height of seven or eight feet, by corresponding breadth, and is a very stately plant.

YUCCA FILAMENTOSA. The Beargrass of our Nashville region, and *Yucca gloriosa* from Savannah and Florida, especially the latter, are very graceful in habit, and yet large and imposing in proportion. They belong to the liliaceous family, and produce in May and June prodigous spikes of large bell-shaped white flowers. Perfectly hardy, they need no attention after they are once planted.

FRENCH HYBRID PAEONIAS deserve much more regard than is paid to them. Although their flowering season is limited, yet they make a splendid show in spring, and need no attention afterward. Their foliage looks very satisfactory until commencement of fall, when it may be cut away, if looking too shaggy, without injury to the plant. It is not necessary for me to urge the culture of roses, verbenas, heliotropes, jasminum, geranium, phloxes, tulips, the common and laricolate lily, etc., as every one knows that these are indispensable.

Hardy and half hardy deciduous or evergreen shrubs are supplied by our nurseries in a large selection. If the selection made does afterward not prove satisfactory, they may be exchanged without entailing much loss of time. In attributing space by planting the narrow-leaved or coniferous evergreens, it must be remembered that they are either shortlived like the golden arbor vitæ and some of the junipers, or growing to considerable size like the cupressus species.

Retinospora aurea, or *argentea*, are really the finest and most

delicate foliaged of this class, and at the same time they have proven here perfectly hardy.

Junipers set on partially shaded ground make very good growth. For most plants of this class is our climate very trying.

Of flowering shrubs I would beg not to forget our native

FRINGE TREE, (*Chionanthus Virginica L.*), whose abundant fringe-like snow-white flowers in early spring give it an unsurpassable charm.

THE CAROLINA ALLSPICE (*Calycanthus floridus* and *laevigatus*), with lurid purple flowers that are very lasting. Bark and foliage aromatic, and the flowers exhaling a fragrance similar to pine apple or strawberries.

THE STUARTIA VIRGINICA and PENTAGYNA are the American representatives of the Camellia tribe. Their foliage is deciduous, but the white flowers, closely resembling a Camellia, are abundantly produced on short pedicels from the axils of the leaves. This shrub is not yet known in cultivation. They abound in the Cumberland Mountains about Sewanee, and in the higher mountains on Ocoee river.

THE MOUNTAIN LAUREL (*Kalmia latifolia L.*), producing profuse, large and very showy flowers, grows abundantly in the siliceous copping of the Harpeth ridge. The transportation of some soil from that region into our gardens is necessary for the success of this shrub, and likewise for

THE AZALEA CALENDULACEA, which grows with the above, and is one of the most attractive American shrubs.

THE TREE ALTHEA (*Hybiscus Syriacus*) is abundantly grown here, but scarcely with that care and attention to present it in its full beauty.

SYRINGA VULGARIS does much better here than the *Syringa Persica*. Highly recommendable.

THE AMERICAN WISTARIA is superior to the Chinese Wistaria, for the latter is very generally spoiled by late frosts, but never so the indigenous. It grows in Col. Cockrill's Bend.

THE ROSEMARY (*Rosmarinus officinalis L.*) is a little shrub, a native of several distinct regions of the countries surrounding the Mediterranean. It extends north as far as the province of Languedoc in France, and the island of Lesina on the coast of

Dalmatia. Already a favorite with the ancient Greeks and Romans, it ought not to be forgotten in our days. An eulogium of this beautiful shrub is unnecessary, but a word in favor of its culture in our region is but an honest tribute to its high merits.

It grows here luxuriantly, flowers profusely in April, and produces an abundance of seed, from which it is reproduced again as easy as thyme or caraway. It stands many ordinary winters unprotected, and should it even be killed sometimes by unusually hard frosts, it is very easily replaced again. The perfume of rosemary is carried far around by the air where it grows abundantly, and the two to six feet high shrubs, with narrow dark green foliage, look sombre and solemn.

The realization of the advantages of tree planting and horticultural embellishment within the city, and the amelioration of the physical condition of the surroundings by similar methods, can only be substantially secured through the influence of an association formed for city improvement, especially for the reason that the appeal is not only made to the private citizen, but to the community at large. It is the environments of the city and the public grounds especially to which our greatest care and attention ought to be directed. It is there where well directed labors will, by the example of an unusual success, lead to the acknowledgement of the high value of such improvements, and stimulate imitation. Such public efforts would at once be a testimony of the prevailing sense of culture and refinement among the citizens; and the association, from the character of its object, would naturally bring together the best elements of the community to an amicable and blissful union.

Maintainance of public decorum and display of respect commanding dignity commensurate to the wealth of the community, are as indispensable to her prosperity as faultless conduct and appearance to the success of the individual. And as there is no personal worthiness without a correlative and duly adjusted self-respect, so must necessarily the virtue and intelligence of the masses making up a commonwealth be greatly doubted when it is not reflected in works of public enterprise.

Patriotism itself, that is, estimation of one's society, is a reflex of self-estimation; and assertion of one's society's claims is an indirect assertion of one's own claims as a part of it. I do not

hesitate to ascribe the obvious deficiency of public spirit in a great measure to the incongruence and incongeniality of our community.

Burdened with the disadvantage of intermixture with an unæsthetic race, we must wake up and preserve an enthusiasm for the higher aims of life, or be in danger of abandoning our high distinction. In regard to our short-comings, let us remember what Herbert Spencer says: "When there has been adequately seized the truth that societies are products of evolution, assuming, in their various times and places, their various modifications of structure and function, there follows the conviction that what relative to our thoughts and sentiments appeared extremely bad, had in reality fitness to conditions which made better arrangements impracticable."

The culture of the fine arts, says Horace, softens the manners and precludes rudeness. Culture and study of plants embraces both art and science.

Entangled, as we often are, with the deep sorrows of life, and at a loss to find the causes and final results of relations that deeply concern us, we may find peace and consolation in the quiet retreats of the vegetable world. Law, harmony and progress become more perceptible as we ascend in the order of beings, until we look upward to the starry heavens, where the celestial bodies continue their quiet and undisturbed path.

May the thoughtful minds of this commonwealth give their attention to the philosophy of evolution, and ponder over it with careful study, for it will strengthen their belief in a better future, and in a higher perfection, which man is destined to reach.

shrubbery ... Nash-
ville ...