

state the paths should be well made and well drained.

The first thing to do would be to plant indiscriminately forest trees where required for a back ground; a couple here, one in another place, perhaps two in another place, perhaps two or three again in another position, except where a screen is required, when trees should be planted thickly, say twenty feet apart, or even in some cases less, the object in the latter case being to gain height for obstruction. Where the fruit or flowers of orchard trees cannot be interfered with, the author strongly recommends the planting of such trees amongst shrubs, as the foliage is not only equal in appearance to other deciduous trees, but the bloom is charming in spring and the fruit useful in summer and autumn.

Trees and shrubbery are generally planted too deep, even by nurserymen. A hole should be made large enough for the roots to be spread and extended their full length and deep enough to come to the hole just above the roots, and after planting the ground should be made solid all around with the heel and the shrub or tree staked to avoid disturbance or movement in the root. All ground, the subsoil of which is inclined to be wet, should be well drained; it would be far better to plant a tree on a mound than in undrained soil; in fact, some trees and shrubs do better when thus planted. Where isolated trees are planted on wet subsoil it is better to form a mound. They not only thrive better, but also a better effect is given to a tree where the latter is not of very tall growth. In purchasing trees or shrubs it is essential that they should have a mass of fibrous roots and not one or two thick tap roots.

The greatest mistake that is usually made in forming shrubberies is too close planting, and in this respect nurserymen err very largely. In shrubberies the knife should be rarely seen; it is far better to give plenty of room between each shrub, and the spaces filled up here and there with, say, a clematis growing over an old trunk of a tree, a strong-growing rose, such as a Gloire-de-Dijon or Ayrshire rose, a clump of tiger lillies, a tree peony or other tall growing herbaceous plants, and all shrubbery should have a small width left for a border. Where the edge comes into contact with grass there is probably no more effective plant for a line of coloring than a good strain of white or yellow violas. It is with the judicious planting of shrubberies and single trees on grass that the best effect is given to a site. The edges of shrubberies generally conform to too geometrical curves. Little nooks should be made here and there, while in another place the edge should jut out into the adjacent turf like a peninsula. In fact, the less artificial appearance the better the effect.

A lake forms a valuable adjunct to a site if there is a small feeder running through the latter, and if a small lake can

only be obtained its size can easily be disguised by making an island or two or forming juts of land covered with trees or shrubs, so that only a narrow view can be obtained from one end to the other, and patches of shrubberies made along its banks with an interval of grass sloping to the water. In this, as in shrubberies, as natural an appearance should be given to a sheet of water as possible, and all geometrical or formal lines avoided. A weeping willow or birch might be planted here and there, and also bulrushes and the common yellow iris along the water's edge. These latter would have to be avoided if any public bathing is done.

Culverts.

In the majority of townships the practice of using timber in the construction of culverts is abandoned and material of a more durable character is being employed for small culverts and sluiceways. Pipes similar to sewer-pipe, but of extra strength, are now manufactured for that purpose, and when properly laid with a free outlet give every satisfaction; pipes made of concrete, unglazed, are also extensively used and prove durable. These pipes can be used with safety up to a diameter of two feet if protected with a cushion of earth between them and the wheels at least eighteen inches in thickness. The carrying capacity of a single pipe can be increased by laying two or three of these pipes side by side, separating them, of course, with a foot or two to prevent them having a bearing directly on each other under excessive pressure, which has often caused trouble. But culverts beyond such capacity, subjected to excessive rushes of water, carrying float wood, etc., require an entirely different style of structure. Brick and stone have been used, and where the material can be obtained make excellent structures, but their use in general is restricted by their excessive cost, especially in districts where this material cannot be obtained, except by railway shipments. Concrete is now being extensively used for culverts of ten and twelve feet diameter, and with first-class cement, workmanship and design, excellent results can be obtained. The townships of Dunwich and Yarmouth have this year built some of these structures, which are models of perfect, durable and finished work. In using concrete it is important to see that the foundation walls are placed on a firm bottom, well below frost line and beneath the action of the current. The walls should have a batter on the side next to the embankment to allow for the action of the frost and prevent the thrust caused thereby doing injury. Crib-work should be securely braced, so that the grout may be thoroughly rammed. Clean gravel should be used in forming the concrete, but clean broken stone is preferable. The sand should be clean and sharp. The cement should be of a well-known brand, delivered in barrels or

some other safe receptacle, and should be protected from the atmosphere. Timber is perishable, and being subjected to repeated condition of wet and dry renders it a very temporary material for such purpose. Where a well-defined watercourse crosses the road the culvert is almost sure to be required for all time, and its construction in the most durable manner is the most economical. Where timber is plentiful it is mistaken for economical, but when the first cost of material and labor is considered and to this is added the cost of maintenance and renewals for a term of years it will be readily seen that durable work in the first instance, although more costly, is less expensive in the end, besides removing that troublesome feature of watching, patching and renewing, which is such a lamentable annual drain upon the municipal treasury. More than this, durable work offers a security to the travelling public and protects the treasury from claims for damages rendered by unscrupulous and reckless users of the highway, the zenith of whose glory is reached while figuring in an action against the public, with nothing to lose and everything to gain.

Working for the Taxpayer.

The town of Galt asked for tenders for the construction of a drain, when the lowest figures received were \$1,047. The tenders were considered too high and the drain was constructed by piece work under the direction of the engineer, the result being a saving to the town of \$403.29. The engineer now points out that as this particular improvement was made with such profit to the town, it would seem to be decidedly advantageous to undertake others, using similar methods, provided that there is a probability of the result being as desirable.—*Guelph Advocate*.

The result of this "trial trip" in municipal construction, in a field generally given up to the contractors, is eminently satisfactory to the taxpayer. Galt having provided itself with a town engineer, a practical and competent town foreman, and road machinery, there is no reason why their ability, loyalty and industry should not, in the interest of the taxpayer, be tried to the fullest possible extent. A saving of forty per cent. on the estimated cost of a small drain gives warrant for the argument that in other public works the same system should be pursued. It puts the corporation officials on their mettle and is fair alike to the taxpayer and the resident laborer. In view of what has been accomplished in the construction of the Ann street drain, there seems to be an opening for the introduction of the same class of work and supervision into the building of cement sidewalks. Why should the profits of the same go to any outside contractor?—*Galt Reporter*.