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THE LARZ ANDERSON COLLECTION OF JAPANESE DWARF TREES

“**T**HE Larz Anderson collection of Japanese dwarf trees presented to the Arnold Arboretum as a memorial to his friend, Charles Sprague Sargent,” is an explanatory statement quoted from the carved inscription displayed with these intriguing plants. This group of dwarf trees is unique in this country and was received at the Arboretum in the fall of 1937. The plants have been on public display in a specially erected shade house ever since. Brought to this country at a time when strict plant quarantines were not in force, these plants were imported with soil around the roots in their original Japanese containers. The Arboretum welcomes the opportunity of being able to display these striking examples of Japanese horticulture to its visitors.

The honorable Larz Anderson became interested in Japanese horticulture as early as 1907 and built a particularly attractive Japanese garden on his estate in Brookline, Massachusetts. Somewhat later he became interested in dwarf trees and in 1913 he brought back from Japan a splendid collection of them, which he acquired while serving as Ambassador Extraordinary from the United States to Japan (1912-1913). These he placed on display in his own garden where they were carefully tended for twenty-five years by different Japanese gardeners. The collection has been displayed at several exhibitions in Boston where it invariably won high honors.

This unique collection is displayed in its lath house between the old Bussey Institution building and the greenhouses, fairly close to the hedge collection. Around the shade house have been planted a few shrubs and trees native to Japan, and during the next few years it is planned to augment this planting. The collection now installed in the shade house consists of 29 specimens all imported in 1913. They are well labelled, but for those unable to visit the collection (the house is open from 9:00 a.m. until 5:00 p.m. each day except Saturday,

Sunday and holidays) the names of the individual plants and their respective ages are given below.

Name of plant	Age
<i>Chamaecyparis obtusa</i>	213 years
“ “	163 “
“ “	148 “
“ “	118 “
“ “	88 “
“ “	63 “
<i>Acer Buergerianum</i>	98 “
“ <i>palmatum</i>	63 “
“ “	63 “
“ “	58 “
“ “	58 “
“ “	53 “
“ “	53 “
“ “	53 “
“ “ <i>multifidum</i>	48 “
“ “	53 “
<i>Cryptomeria japonica</i>	48 “
<i>Larix leptolepis</i>	138 “
<i>Photinia villosa laevis</i>	68 “
<i>Prunus mume</i>	98 “
“ “	88 “
“ <i>subhirtella</i>	98 “
“ “	88 “
“ “	78 “
<i>Thuopsis dolobrata variegata</i>	43 “
“ “	43 “
<i>Zelkova serrata</i>	88 “
“ “	63 “
<i>Chamaecyparis pisifera squarrosa</i>	} 43 “
<i>Cryptomeria japonica</i>	
<i>Euonymus fortunei radicans</i>	

“Bon-sai,” the art of training dwarf trees

Century old customs have been handed down by the Japanese regarding the training of the interesting dwarf trees so characteristic of the gardens and homes of that country. There are several reasons for their existence. In the first place, Japanese and Chinese gardens are usually small, for space is at a premium. This is particularly true in the urban areas where the art of making gardens on a very small scale is centuries old. Then, too, the oriental’s well known appreciation of the aesthetic value of living plants has been a prime factor in their cultivation. It often takes fifty to one hundred years to grow a worthy specimen dwarf tree, yet it is possible by twisting the trunk and restraining the growth of tops and roots to give a comparatively young plant the appearance of great age. This



PLATE IX

Chamaecyparis obtusa. 163 years old. (Larz Anderson Collection.)

treatment requires a thorough knowledge of horticulture as well as painstaking patience, but many Japanese are fascinated with "Bon-sai" and practice it as a pastime.

Training

Most woody plants can be dwarfed if given the proper training. If the branches and roots of growing plants are vigorously restrained from developing rapidly, the individuals soon become dwarfed and this is the principle underlying all training. Then, too, great care is given to the training of the trunk, the spread of the branches and their shape, and the spread of the roots, since each can be so trained as to give the impression of great age. Many methods have been devised through the centuries for attaining these ends. Maples, bamboos, cherries, pines, hollies, oaks, azaleas, junipers, and many other plants have been used. They are grown in comparatively small containers, kept pot bound throughout their existence, and carefully and judiciously pruned to maintain the desired type of growth.

Whenever possible, the Japanese start with plants that have already been dwarfed by nature. These are searched for in the high mountains, in regions often unfamiliar to the ordinary traveller. Such plants are frequently found growing in high rocky crevices, just barely existing for lack of sufficient nourishment. If these are dug immediately and removed, they might succumb at once for the delicate balance between the amount of root system and bare existence is easily upset. The plant hunter may locate such plants several years before he will venture to remove them from their rocky dwelling. At first he will prune a small portion of the plant and leave it in place for a year; then he will return and root prune another small portion, repeating this process until it is safe to move the plant. In this way splendid specimens are obtained that have already been trained with the assistance of mother nature herself.

If dwarf plants are to be trained from the seedling stage, the smallest and weakest seedlings are selected. Conifers are considerably easier to train, for they do not form adventitious buds as readily as do the broad leaved plants. The seedling is placed in a very small pot. If there is a tap root, it is pruned considerably, and if a central leader is present, it too is cut back. In order to obtain the desired effect, only certain branches are allowed to develop. As an example, *Chamaecyparis obtusa* is ordinarily a very bushy plant, yet the illustration shows only a few picturesque branches. These few branches have been carefully selected and trained, while the others have been entirely removed. If one of these branches should die, eventually a new bud would be allowed to develop a branch to sufficient size to take the place of the deceased one.

To give the correct appearance of wind-contorted shape, the main stem is often twisted around an upright, and after a formative period the upright is removed. This twisting in itself is a dwarfing process, since frequently it breaks a large number of the conducting vessels in the stem. Branches are twisted in like man-



PLATE X

Pinus jeffreyi in Yosemite National Park has been continually dwarfed by nature for an estimated 600 years.

ner. They may all be trained on one side of the plant, or arranged to droop on one side of the pot, or trained in any one of a dozen different ways. The Japanese gardener usually has a model in mind when he trains his plant, some wind-twisted tree which he is trying to reproduce in miniature form, and it is surprising to the uninitiated to observe how accurate these reproductions can be.

Often in nature one observes old gnarled trees the larger roots of which are exposed, especially when growing in rocky places where there is still soil. This effect is reproduced by the "Bon-sai" artist by growing his seedling in charcoal and moss for a period sufficiently long to induce long roots. When the plant is removed to its permanent container, a part of these roots are left to develop above the soil level, eventually aiding materially in giving the plant the appearance of great age.

Pruning, Repotting and Watering

Not all branches are entirely removed. Some of these century old plants have numerous picturesque stubs, certain gardeners believing that these add to the beauty of the plant. Any diseased tissue on such stubs is carefully scraped, disinfected, and painted. Sometimes in order to gain the appearance of stubby old age rapidly, taller plants that have been growing normally are used. The basal branches are cut back to give the stubby appearance. The top is entirely cut off. The plant is dug and after many of the roots have been removed it is placed in a small pot. Then certain of the adventitious buds are allowed to develop, or else scions are grafted at the desired places.

Grafting is also resorted to when certain shoots die. If a very important branch has died, it may take many years for a new one to grow to a sufficient size from an adventitious bud, so that grafting is often resorted to. The Japanese are particularly adept at this and take great pains in training an individual branch by pinching the buds back here, or twisting the branch there, and so forcing the latter to grow in the desired fashion. The pruning and pinching operations are done during the active growing period, since the development of branches from adventitious buds is then more frequent.

Dwarf trees are repotted every four or five years for two reasons. In the first place it is necessary to remove some of the newly developed fibrous roots so that the tree will remain dwarfed. Secondly, it is necessary to mix a small amount of fertilizer with the soil, since as these trees are forced to grow in very small containers, there is not sufficient room for enough soil to allow new root development unless the plant be artificially stimulated with nutrients.

It is also advisable to keep a fresh layer of green moss on the surface of the soil. This not only adds the impression of age, but keeps the soil from drying out. The containers are usually provided with a hole in the base for proper drainage. In the hot summer days there is some danger of the soil becoming too dry, and at such times the plants need special attention. Spraying the foliage with

water once or twice a day during the hottest spells of summer is advisable in order to keep the plant in good condition.

Dwarf trees cannot be considered primarily as indoor plants. They may be used indoors for short periods, but must be grown in the open a greater part of the time. Because of their very small root system, and the small containers in which they are grown, these dwarf trees cannot lose much water through transpiration and still survive. Consequently they must be grown in a shaded location. The shade house in which this location is being maintained at the Arboretum was designed and erected especially for this purpose. Constructed of cypress wood, the top and sides of the house are covered with strips $1\frac{1}{2}$ inches wide with similar spaces left between each strip. This supplies plenty of shade and at the same time keeps the atmosphere considerably cooler and reasonably moist.

Winter Protection

Although many of these trees are hardy, they cannot survive our northern winters because of their shallow root system, unless given some winter protection. A Japanese maple, for instance, growing normally in the ground may survive a winter during which the temperature goes to 20° below zero although the top of the plant may be killed to the ground. However, in these small pots the roots of dwarf trees would be subjected to temperatures almost as low as those of the surrounding atmosphere, and consequently the whole plant would be killed. During the winter in the north, they are best put in cold frames or pits which are well protected with glass and even with boards and mats during the most severe weather. In our pit where these plants were stored last winter the temperature did not go below freezing, although the temperature outside the pit dropped to zero on several occasions. Another danger from freezing temperatures is that with the expansion of freezing soil the containers may break. Although these are seldom ornate, since the Japanese believe that the plant itself should be the point of interest, nevertheless their simplicity alone is beautiful and makes them important adjuncts to any such collection and thus worthy of full protection.

Thus with an exacting knowledge of the numerous rigid requirements of the art of "Bon-sai" the painstaking Japanese gardener is able to reproduce dwarf trees that are exact replicas in everything but size, of century old specimens as they occur in nature. The Japanese have developed other forms of dish gardening, but to the American horticulturist perhaps none is so interesting as "Bon-sai."

DONALD WYMAN