

SOURCES of MATERIAL for BONSAI

Chapter 17

NOTES

I. OBJECTIVES

As a result of studying this section of the *Intermediate Bonsai Syllabus*, viewing audio visual presentations, or participating in other activities provided by an instructor, you will be able to:

1. Identify sources of plant material for bonsai.
2. Describe possible potential sites for collecting plants.
3. Discuss legal precautions to take when considering a field collecting trip.
4. Discuss safety precautions which should be taken prior to and during a collecting trip.
5. Identify some of the tools, equipment and supplies which would be appropriate in your location.
6. Discuss etiquette which should be observed when collecting plant material.
7. List some of the safety factors which should be a concern during a collecting trip.
8. Describe the process of collecting a plant from the wild which is suitable for bonsai.
9. Discuss the post collection care of collected material.
10. List several advantages and disadvantages of propagating bonsai material from seed.
11. List several advantages to propagating bonsai material from cuttings.

12. Explain why a “V” shaped cut on the base of cutting is desirable when propagating bonsai material.
13. Explain the general purpose and process of cleft grafting.
14. Explain the general purpose and process of inarch grafting.

II. GENERAL

A. Species of Plant Material

1. There are hundreds of species of plant material which are appropriate for bonsai. Many of them have sub-species called “varieties”.
2. Many of the species appropriate for bonsai are genetically dwarfed. This means that they have been genetically engineered to produce smaller leaves and shorter internodes.
3. Not every species will grow in every climate or in every growing condition. For best results determine which species perform best in your particular climate and growing conditions.

B. Sources of Plant Material Suitable for Bonsai

1. A major source of material to be used in the creation of bonsai is to buy it from a general purpose nursery or garden center.
2. Another source for material may be from a bonsai nursery, from mail order suppliers or from a friend who is willing to part with a plant from his collection.
3. Material for bonsai may be propagated by the reproduction or multiplication of material from one or more existing plants. Plants may be propagated from

seed, by taking cuttings and rooting them, by grafting and by layering. Each of these will be explained.

4. Finally, one of the more challenging sources for plant material is to collect existing materials which are growing in the ground. They may be growing either in the wild or in cultivated areas.

III. COLLECTING MATERIAL FROM THE GROUND

A. General

1. There are several reasons for collecting material from the ground. Mature and weathered specimens are easier to find in the field than in nurseries. The cost is usually just your time. If native or adapted material is gathered locally it is already accustomed to your climate.
2. Late fall or early winter are the ideal times to collect material in nature because they have stored the necessary nutrients for the winter and are generally dormant.
3. Trees which have been stunted can often be found on the side of streams, roads, near bridges, along railroad right away, in pastures, and in rock crevices. Much of the stunting occurs from repeated cutting back.
4. Other desirable material, while not necessarily stunted, may be found in vacant lots, wooded areas, on land about to be cleared to make way for construction projects, and at business and residential sites where older plant material is going to be removed to make way for new landscaping.

B. Organizing a field collecting trip

1. When organizing a field collecting trip it is important to comply with all facets of the law.

- a. Permission must be obtained from the property owner or caretaker before entering upon any private land and before digging on any private or public property. Permission should be obtained in writing and all parties should have a copy.
 - b. The highway right away is a convenient area in which to collect material. Underbrush is usually kept low, some desirable plant material may have been stunted from repeated cutting by road maintenance crews, and there is easy vehicle access to get to the material and to haul it away. While these areas are public access areas, they are under the caretaker management of some governmental entity. Generally there is no problem looking about on the right away for suitable plants, but permission should be obtained before doing any collecting.
 - c. A railroad right away provides a less convenient area in which to collect material, but the effort can be quite rewarding. Railroads periodically cut foliage on their right away just as do highway departments. Permission to both enter the right away and to collect plant material must be obtained.
 - d. When requesting permission to enter and dig it is important to specify the date or dates on which entry and digging will occur, what type, size and quantity of material is being sought, and in what condition the land will be left when finished.
2. Safety of the collecting party is most important.
 - a. Wooded areas are a haven for snakes, stinging insects and other animals which are not pleased by human intrusion. Their nests may be hanging from a tree or be built into the ground and remain unseen until the unwary collector disturbs them.

- b. Snakes may be found in trees as well as on the ground or in the water. Wild boars, wild dogs, rabid raccoons, and feral cats may also present a hazard. On pasture and range land, the domesticated animals may not be friendly to humans.
 - c. If the collecting trip is sponsored by an organization, that organization should either provide insurance applicable to the situation or should have a legally binding release of liability from the participants.
3. Clothes, tools and supplies
- a. Clothing should be appropriate to the season and most importantly, adequate to protect the head, arms and legs from exposure to the sun, poisonous plants and brambles. It is wise to bring a complete change of clothes. If it is a cold day, dress in layers.
 - b. The equipment needed depends on the area in which the plant material is located, distance from access roads, type and size of material to be collected and the nature of the medium in which the plant is growing. Generally a shovel or spade, pruning saw, lopping shears, hand shears and pry bar are needed.
 - c. Because anything dug has to be removed from the area, some means of getting the collected material to transportation must be considered. Small vehicles, carts, wagons, baskets, back packs, or poles on which to sling the material may be appropriate.
 - d. Supplies should include drinking water, food, a first aid kit, sunscreen, large nursery cans, burlap bags or heavy duty plastic garbage bags, twine, water for roots, and colored marking tape or tags.

C. Collecting material

1. Collecting etiquette requires that only those items which are to be removed be dug, that holes be filled in, that no trash be left behind, that any gates opened are closed, and that no structures or remaining plants be damaged.
 - a. When entering an area do not start digging immediately. Instead locate and tag plant material which appears to have bonsai potential.
 - b. Decide on how many plants can reasonably be cared for and then select the tagged items which will be collected.
 - c. Make sure the tree is alive. If dormant, scratch a twig to see if there is green cambium below.
 - d. Dig surface soil away and check for satisfactory surface roots.
 - e. Evaluate the taper and trunk diameter.
 - f. After removing a plant fill in the hole with soil and with any branches and foliage which had been removed.
 - g. Before leaving the area, remove the tags from plants which were tagged but not dug.
2. Method of digging
 - a. After selecting a plant for collection it is important to establish a new balance between the amount of foliage and the amount of roots remaining after digging. This is done by removing all branches which will not be needed, shortening the height of the tree where appropriate, and removing much of the remaining foliage.

Sources of Material for Bonsai, Continued

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- b. Around the trunk outline a circle in the soil which has a diameter less than the diameter of the intended container.
- c. With a sharp shovel or spade, make vertical incisions, cutting the soil and roots below this circle to a depth equal to the length of the tool's blade. Use a pruning saw or lopping shears to cut heavy roots.
- d. If time and circumstances permit, defer removal of the material from the ground and leave it in place for collection later. This gives the plant the opportunity to grow new feeder roots and to begin recovering from this initial shock while still retaining its downward growing roots.
- e. If the material is to be removed, dig a trench just outside the root ball and tunnel into the root ball. Under the root ball cut the downward growing roots. Continue until its root ball is free to be lifted from the hole.
- f. Keep as much of the root ball (roots and soil) intact as possible. If all of the soil falls off the roots, put some in a container to use when potting the plant.
- g. Wrap the root ball in sheet plastic, a plastic trash bag or burlap, tying it securely with twine to help keep the root ball intact.
- h. After the collected plant has been moved to the transportation, moisten the root ball to keep it from drying out.

D. Post collection care and cultivation

1. The collected material may need a second pruning after arriving in the work area.
 - a. The length of the roots and branches to remain is determined by the shape of the tree and the dimensions of the pot.
 - b. The length of the major roots should be slightly shorter than the dimensions of the bonsai container into which they will ultimately be planted.
 - c. The tree is then planted in a nursery container or in a nursery bed. It will rarely be planted directly into a bonsai container. Tie the plant securely in its container to prevent it shifting.
2. The first watering should be thorough and an anti-shock solution such as Superthrive® should be used.
 - a. Plants having tall trunks should be wrapped with moss to reduce moisture evaporation. As the weather gets warmer they should be sprayed with water every morning and evening so that the covering remains moist while the soil is not too wet. An intermittent mist system may be needed for some time to prevent dehydration.
 - b. Collected trees need to be protected from sun, wind and extremes of temperature for two to four weeks, or until they appear to no longer be stressed.
3. Intensive care needs to continue after the plant begins sprouting.
 - a. Sprouts may be a result of food stored in the plant rather than as a result of nutrients currently being manufactured by the plant.

- b. Excessive new growth should be removed to prevent weakening the plant and to channel existing nutrients into those growth points which are to be retained.
 - c. Protect the plant to prevent the new buds from being scorched by the sun as well as to reduce evaporation of moisture from the leaves.
 - d. After a month gradually reduce the time spent under shade.
4. In about six weeks as the plant appears to be recovering, begin applying small quantities of diluted fertilizer to stimulate leaf, branch and root growth.
 5. If additional root reduction is necessary, wait a minimum of one year and preferably two before making any drastic cuts on the roots.

IV. BUYING MATERIAL

- A. Buying material from a general purpose nursery or garden center.
 1. Suitable material for bonsai may be found in nurseries and garden centers.
 - a. Plants in garden centers are container grown while those in nurseries may be in containers, balled and wrapped in burlap, or still growing in the field. Nurseries will usually have a greater variety of sizes of material than will garden centers.
 - b. Often a group of plants will at first appear to be all the same; of a uniform size and shape. Look carefully to spot one or more which are somehow different: smaller leaves, shorter internodes, more compact, or greener color.

- c. Take time to look closely at any tree you are considering buying.

3. Selecting Material

1. It is most important to select healthy material and a species which is appropriate for bonsai.
2. Detailed guidance is given in *Introduction to Bonsai - A Course Syllabus* on the selecting of suitable plant material from general purpose nurseries and garden centers. But, in general:
 - a. Look for a plant with a well shaped trunk, tapering from a broad base to a slimmer apex. Carry a small root hook or root rake with you to help dig into the soil to find the surface roots and to locate what will be the base of the tree.
 - b. There should be strong and healthy lower branches which are attached no farther than one third the way up the trunk of the bonsai once styled. There should also be plenty of branches higher up on the tree.
 - c. Consider the size of the leaves and needles; they need to be in proportion to the expected size of the bonsai.

B. Buying material by mail order

1. Get the opinion of others concerning a particular mail order source.
2. Order only material which will thrive in your plant growing area.
3. Do not have a shipment made during weather which would be detrimental to the plant while in transit.

C. Buying material from a bonsai nursery or private collector.

1. Evaluate the material the same as when buying from a general purpose nursery or garden center.
2. The price includes the grower's time and overhead expenses as well as the tree and its container.

V. PROPAGATING BONSAI MATERIAL BY SEEDS

A. General

1. Plants have been duplicating themselves since the beginning of time. They propagate by dropping and germinating seeds, roots sprout new trunks, one part of a plant grafts itself onto another part and low or fallen branches root.
2. Some species of plants suitable for bonsai cannot be collected locally. To obtain multiple plants, it may be appropriate to artificially propagate them by sowing their seeds, by rooting cuttings, by dividing, by grafting one plant onto another and by rooting by layering.

B. Raising bonsai from seed

1. There are seeds from plant material which are suitable for bonsai. However, there is no such seed as a "bonsai seed" which, after germination, will guarantee a bonsai.
2. Developing bonsai from seedlings has several advantages:
 - a. Root spread can be controlled.
 - b. Early root ramification is possible.
 - c. By removal of buds along the trunk, branch placement can be regulated.

- d. Trunk shape can be determined more readily.
- 3. The disadvantages of developing bonsai from seedlings include:
 - a. It takes more time than most other propagation methods.
 - b. The genetic characteristics of the seed do not necessarily match the parent.
- 4. Bonsai can be started from either deciduous or evergreen seedlings , but results are more likely to succeed and will be quicker with deciduous material.
 - a. Seeds should be fresh because to a large extent a seed's vitality is determined by its freshness.
 - b. Soak the seeds in warm water for several hours before sowing to assist germination. Hard shell seeds may need to be treated by scratching, filing or cracking the shell or by cutting and removing the end of the seed to aid germination. Care must be taken to not damage the embryo or the sack enclosing it.
 - c. Seeds will not germinate without a supply of oxygen. The planting medium should be open and well-drained. Equal parts of compost and coarse sand is a practical rooting medium.
 - d. Place the seed on the surface of the soil and cover with a layer of growing medium to a depth of about twice that of the seed.
 - e. Water gently from the top or set in a container of water so the medium can absorb water from the bottom. Remove from the water when the medium is saturated. The seeds and their medium may be placed under a mist sprinkler or be covered

- with damp sphagnum moss. Do not let the soil dry out.
- f. The seeds and their medium should be kept relatively warm, at about 70 degrees F.
 - g. After germination gradually move the container to full sun light.
5. When the seedling has developed a sufficient root system,
- a. Remove it from its container, remove the rooting medium from its roots and immerse its roots in cool water to thoroughly dampen them.
 - b. Cut its tap root and any heavy coarse roots, leaving the fibrous roots.
 - c. Decide on a probable style for the tree and remove any unwanted branching or excessive trunk. Re-immerses the roots in cool water as necessary.
 - d. Use a potting mixture appropriate to your location which will encourage root development and which will provide stability for the tree.
 - e. Plant the seedling in an individual clay or plastic nursery pot with the thickest portion of the trunk at the soil line. Water thoroughly and replace outside in full sun.
 - f. Begin fertilizing with half-strength liquid fertilizer or apply slow-release fertilizer to the soil surface.
6. In early summer prune most species of seedling as necessary depending on the plan for its growth and styling. Repeat annually the spring repotting and heavy root pruning and the spring and early summer branch pruning.

7. Evergreen seedlings are pruned drastically only in the early spring.

VI. PROPAGATING BONSAI MATERIAL FROM CUTTINGS

A. Propagating bonsai material from cuttings has several advantages:

1. It is a much faster method than by propagating from seeds.
2. The cutting has the adult characteristics of its parent; it is already mature and will flower and fruit the same as when it was part of the parent..

B. There are three types of cuttings.

1. Hardwood cuttings should be taken when the plant is dormant and should be selected from matured wood, usually of the previous season.
2. Semi-hardwood cuttings are taken from firm current season wood minus the soft tip.
3. Soft tip cuttings are taken from the growing tips of branches.

C. Propagating by cutting. (Note, some of the following does not apply to propagating using soft tip cuttings.)

1. Select and cut a nicely shaped branch from the parent and make the cut just below a node. The cutting should be three to five inches long with several nodes.
2. Begin styling the cutting immediately by deciding on the angle it is to have when it emerges from the soil after rooting and by removing unwanted branches.
3. Remove the soft tip as well as the leaves on the lower portion of evergreen cuttings. Remove all leaves on deciduous cuttings.

4. The new bonsai should have an evenly distributed root spread. Identify what is to be the left and the right sides of the new plant and with a sharp, clean knife, make a forty five degree cut on each side. This will create a "V" shaped wedge on the lower end of the cutting. The "V" shape increases the potential rooting area and directs rooting toward the two sides of the plant. Do not allow this lower cut to dry out and if you use tobacco, do not touch it with your fingers as nicotine will inhibit growth.
5. IMMEDIATELY dip the "V" shaped wedge into rooting hormone.
6. With a pencil or chop stick, make a hole about an inch deep in the rooting medium (well aerated coarse sandy soil or vermiculite) and insert the cutting into the hole at the desired angle and pack the rooting medium around it. Water thoroughly and do not allow the rooting medium to dry out. Label the cutting with date and species' name.
7. Frequently mist the cuttings or provide humidity by an alternate means.
8. Periodically carefully check for rooting as new roots break very easily. When sufficient roots have grown, lift the cutting and its root mass from the rooting medium and plant into potting soil. Gradually move the rooted cutting into sunlight and do not let it dry out.
9. Cuttings may be taken from **roots**.
 - a. A root is an underground extension of the trunk and will often sprout just as the conventional trunk sprouts.
 - b. Severed tap roots, as well as other substantial roots, may develop buds at their tips when planted with a portion of the upper root exposed.

- c. Growth along the exposed portion of the root may be stimulated by scratching the root where a branch is wanted.

VII. PROPAGATING BONSAI MATERIAL BY DIVIDING

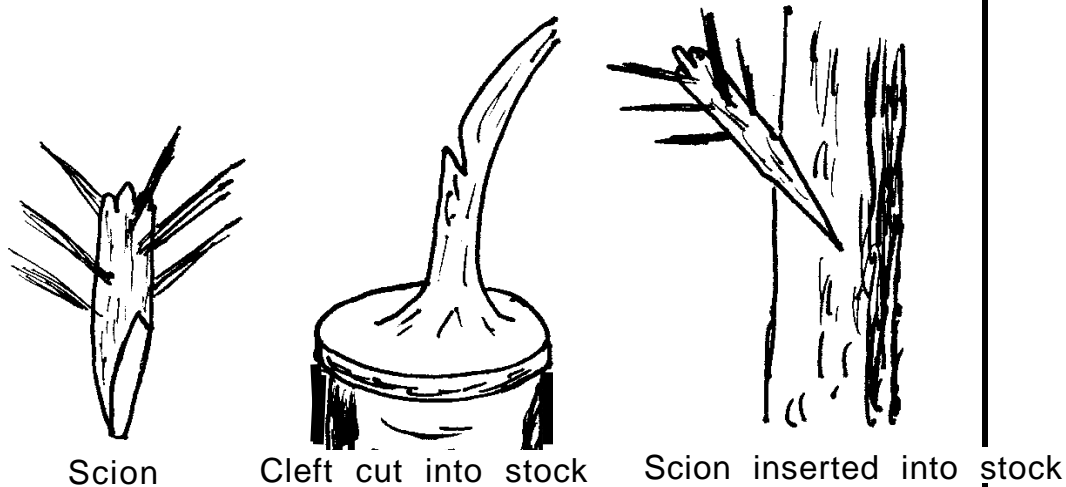
- A. Propagating dwarf bamboo is an example of propagating by dividing. Bamboo, and other plants which tend to grow in clumps, have underground runners which sprout new plants. With a saw the mass of roots and runners can be divided and each division potted separately.
- B. When roots are removed while repotting, one may often be potted in a nursery container with what is to be its new trunk above the soil surface. Properly tended it will sprout and create a new plant.

VIII. PROPAGATING BONSAI MATERIAL BY GRAFTING

- A. Propagation by grafting may be used when cuttings are not generally successful. It may also be used for those species which vary greatly when propagated by seeds. Additionally, grafting may be used:
 - 1. To increase disease resistance or adaptability of plants as when a scion (the new portion) from a lesser species is grafted onto one with a hardy root stock.
 - 2. To repair damaged material. An example would be to replace a broken branch.
 - 3. As a means of enhancing material by adding branches where none exist.
- B. Grafting is best done in early spring. The tree should be dormant with no sap rising. Most scions should be one and a half to two inches long with one or two strong buds. The lower end of the scion is cut to form a wedge. Do not allow this end to dry out.

C. **Cleft grafting** is used to graft a scion onto a stock which has a much greater diameter. A cleft, or slit, is cut into the stock and the wedge shaped end of the scion is inserted, the cambium layers are aligned, and the union is sealed with grafting wax. The cleft on the stock plant may be in the side of the tree or it may be in the severed top of the stock.

1. Cleft grafting into the side of a tree may be used to create a bonsai which has a branch where none existed before. This type of a graft leaves no clearly visible graft joint. If an attempt fails, another may be made with minimal damage to the tree.

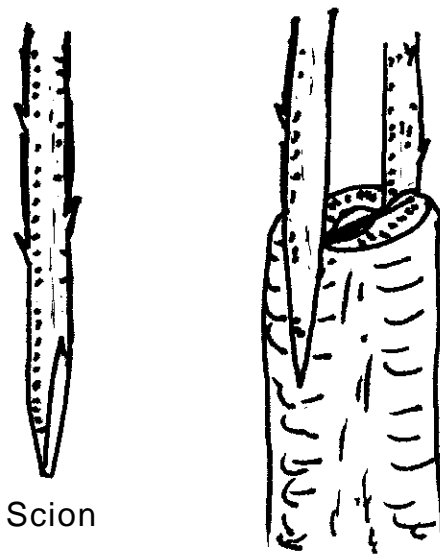


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2. Cleft grafting permits the substitution of branches and foliage of a more desirable species for those on a less desirable root stock. As an example, scions from a slender five-needle pine may be cleft grafted onto the stock of a sturdy black pine, gradually replacing the black pine's foliage. This will result in a plant with a large, rough barked trunk which has fine foliage.
3. The wedge cut on one side of the scion is longer than on the other. The long side of the cut is the top side of

the scion when inserted into the cleft on the stock plant.

4. When cleft grafting a pine, all but 4 to 6 bundles of needles are removed from the scion.
5. A cleft graft may be done on a severed trunk to create a *broom* style bonsai. The wedge cuts on the lower end of the scion used in this graft are of equal length.



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6. After the graft is made, the grafted area is sealed with grafting wax.
- D. **Bud grafting** is similar to cleft grafting except that a bud instead of a scion is grafted onto each young branch of the stock.
1. Bud grafting may be used when the stock plant has well matured branches suitable for bonsai.
 2. A variety of buds may be used, as in the case of an azalea, to provide a variety of flower colors on a single stock plant.

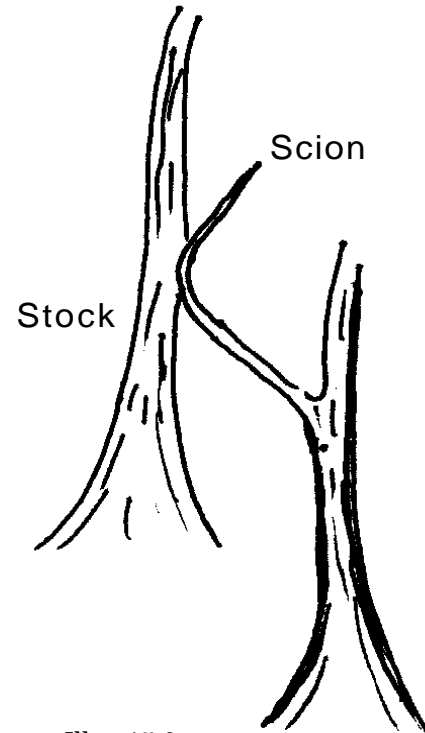
Sources of Material for Bonsai, Continued

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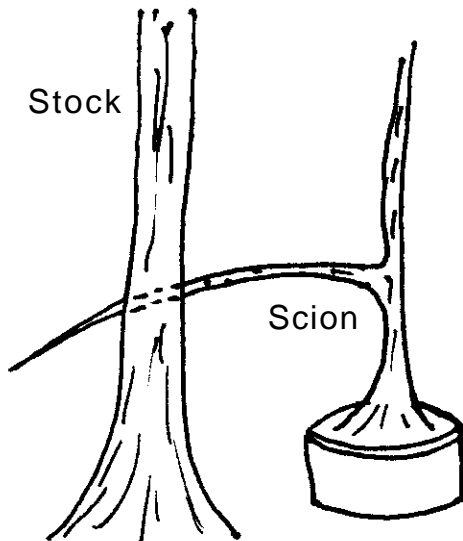
3. Bud grafting is a specialized form of grafting and expert instruction should be obtained prior to attempting to bud graft.

E. **Inarch grafting**, also called “approach grafting”, is a safer grafting method because the scion is not severed from its parent until the graft has taken.

1. Branches may be added where none currently exist.
2. The scion already may be attached to the tree onto which it is to be grafted, or it may be a branch attached to another tree.
3. One method of inarch grafting to create a new branch on a stock plant is to scar an area on both the scion and the stock where the union is to occur, and tie or tape the two scarred areas together.



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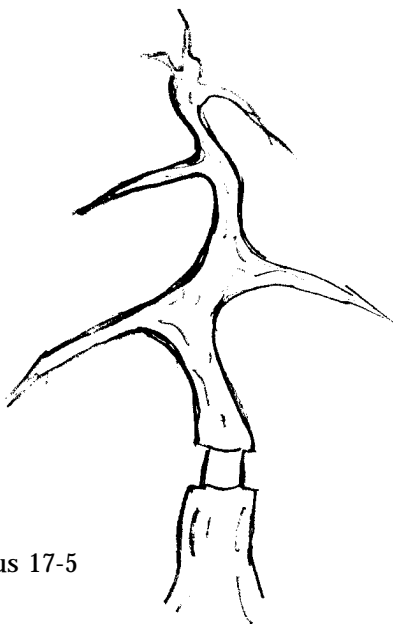
4. Another method which gives a more natural joint, is to drill a hole through the stock plant and to thread the scion through the hole, scarring the scion at the desired point of union.

IX. PROPAGATING BONSAI MATERIAL BY LAYERING

A. Layering is best done in early spring. There are several methods of layering: air layering, tourniquet layering and ground layering.

1. Air layering

- a. Propagation by air layering is done when a branch or the top of a trunk is to be made into a new and separate tree. The air layer creates a new root system for the new tree. A tree in the wild, one in the yard or one in a nursery container may have an air layer applied. There are several air layering techniques, but one of the easiest is the **ring-bark** method.
- b. Decide where the new soil line should be on the new material. That location is the site of the air layer. Prepare a Superthrive[®] solution and soak some sphagnum moss in the solution.



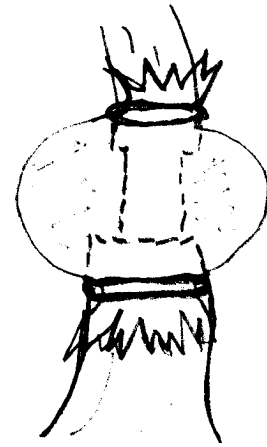
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Prepared stock

- c. Using a clean, sharp knife, cut a ring all the way around the layering site. The cut should go through the bark and the cambium. This will be the soil line for the new material. Make a second cut parallel to the first and about an inch below it. Peel off the bark and the cambium between the two cuts. Scrape away any cambium so that the hard wood is clean.

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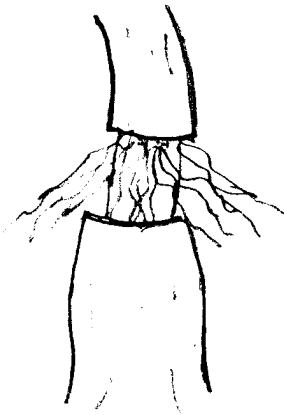
- d. Dust the cambium of the upper ring cut with a rooting hormone. Take some of the Superthrive[®] soaked sphagnum moss, squeeze out the excess liquid and put the moss onto the air layer, covering the entire air layer area. Tie the moss on with twine by criss-crossing the moss covered area. Next cover the entire air layer area with a layer of Saran Wrap[®] and then a layer of aluminum foil, tying it at the bottom and loosely at the top. Flare the foil at the top to act as a water cup. Check that water will flow through the layered area.



Rooting medium secured around cut

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- e. Water the air layer just as if it were a potted bonsai. The sphagnum moss should not dry out.
- f. Periodically check for roots by removing the aluminum foil. Remember to replace the aluminum foil as roots need darkness. When a goodly number of roots can be seen through the clear wrapping, cut the layer off the plant stock.



Roots developed

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- g. When the plant is separated from the stock plant, spread the roots evenly around the trunk and adjust the angle at which it leaves the ground. Plant it in a potting soil in a nursery container. Secure the plant within the container to prevent it moving about and breaking newly forming roots.

2. Tourniquet layering.

- a. A tourniquet of copper wire is put around the trunk or branch about an inch below the place where the new roots are desired. This will keep the sap above the tourniquet.

- b. Wrap the area immediately above the tourniquet with moist sphagnum moss and cover with plastic and aluminum foil as described earlier for air layering.
 - c. Monitor and remove the layer as described earlier for air layering.
3. Ground layering.
- a. In ground layering a branch is bent to reach the ground or a pot of soil. The area where roots are desired is scarred, dusted with rooting hormone, buried in the soil and weighted, tied or pegged down securely. An alternative to scarring is to split the branch and inserting a stone to spread the cut, dusting with rooting hormone and burying.
 - b. Monitor and remove the layer as described earlier for air layering.

X. SUMMARY

- A. To be successful, field trips for collecting suitable bonsai material should be planned.
- B. There are several advantages and disadvantages in propagating bonsai material from seed.
- C. Propagating bonsai material from cuttings has several advantages which propagating by seed lacks.
- D. There are several methods of propagating by grafting. The cleft graft leaves the most natural union joint.
- E. Propagation by air layering is a technique of creating roots on a branch or along a trunk to create a new and separate plant.