

Other Things To Do

Here are some other interesting things that you may wish to do in this lesson. Try some of them.

16. Collect the fruits (cones, nuts, pods, samaras, etc.) of at least five different kinds of trees and make a display to show the differences among them.

17. Make a poster or a 3-dimensional exhibit that illustrates the different ways trees can be reproduced both naturally and artificially.

18. Establish your own home forest-tree nursery.

19. Plant the seedlings produced in your nursery for some private or community purpose, such as Christmas trees, windbreaks, roadside beautification or reforestation.

A3 Tree Identification

This section will help you learn how trees differ. By these differences you will find out how to identify trees that grow in your own area. In your notebook or recordbook, record all that you do in your 4-H Forestry project.

Meeting 6 How We Identify Trees

Each kind of tree has several characteristics. These help us identify it. After you become familiar with a particular species, you will not have to make a close check to tell what it is. You can recognize a close friend at some distance, right? Soon you will be able to name trees as you ride by in a car or bus.

Each kind of tree has some dependable ways by which it can be recognized. Therefore, it is not a tiring study each time you want to identify a tree. The following characteristics are most often used in tree identification. They are in the order of their usual value in everyday identification.

Leaves help us identify trees. Leaves have size, shape and color. We look at the arrangement of the twig, margin, thickness and vein patterns. Leaves may be rough, hairy, stiff or sharp. We may taste, smell or feel leaves to identify them.

Fruits help in identification, too. These are fruits such as cones, berries, nuts etc. Fruits have size, shape and color. They may be husked or bare, armed or unarmed, fleshy or dry. Fruits may have one seed, few or many seeds. And, fruits may have taste.

Bark may be described by color, thickness, roughness, smoothness, scaliness, stringiness and patterns of ridges and furrow. We may look for the presence or absence of lenticils and resin blisters on the bark.

Buds on trees have size and color. They are arranged on the twigs in different ways. Buds may be rounded, sharp, resinous, smooth, single scale or have few or many scales. Buds may burst into flowers and twigs. This twig arrangement on the stem is a key to identification of some species.

Twigs have color, are smooth or hairy and maybe stout or slender. They may have leaf scars and pith. *NOTE:* Twigs are quite helpful in wintertime identification of deciduous trees.

Growth habit - The shape of the crown is a helpful aid in identifying trees. Crown density, branching patterns and colors are useful too. The long, dense spire-like crown of the high-mountain fir, the umbrella-shaped crown of American elm and the drooping leader of young western hemlock are examples of growth forms

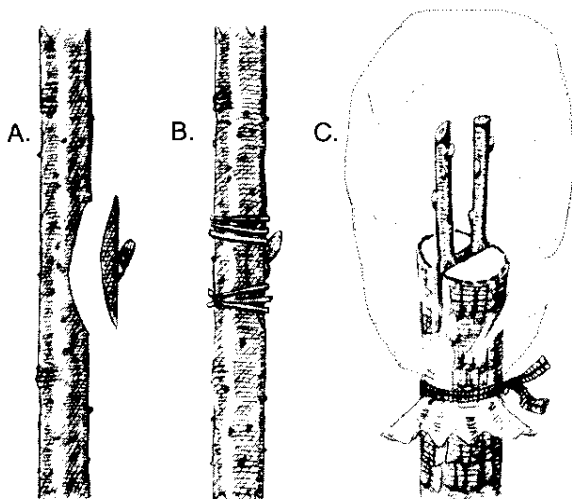


Fig. 11

- With a sharp knife, shave a bud scion off the tree to be reproduced. Make a very simple cut on the stem of the host or rootstock.
- Place the scion in the cut so the cambiums match and bind with the rubber band.
- This is a method of grafting called *wedge grafting*. Cut two scions, making the bottom ends wedge-shaped. Split the end of the rootstock and insert scions so as to get the best cambium match. Use grafting wax, a coating compound, or a plastic bag to protect graft from drying out.

that identify the species. Some trees are known by their habit of **growing** in a certain location.

Flowers - All trees excepting some hybrids have flowers. On many species, the flowers are small and of brief duration. They aren't much help for everyday field identification. The flowers of some trees help identify them. These are black locust, buckeye, redbud, magnolia and dogwood.

Wood - Any species of tree can be identified by the characteristics of the wood alone. However, a microscope or hand lens is needed to identify wood. Wood characteristics are not used very often in everyday tree identification.

Things To Do

1. Make a display that shows how to identify trees. Show three types of leaves, three types of twigs, and three types of fruit which are useful in identifying trees.

2. Collect and exhibit 10 different kinds of tree leaves. Write out and point out for the viewers the differences in leaf margin, base, tip and form.

3. Collect and exhibit 10 different kinds of tree fruits. Write notes to point out their differences. First divide them into groups; some may be nuts, some legumes, some samaras. Then, show the differences within the groups, such as size, seed covering and other characteristics.

4. Collect and make an exhibit of twigs from 10 different trees. Point out twig characteristics that enable one to identify the tree from which it came.

5. Identify 10 different kinds of trees. Learn at least three good identifying characteristics for each tree. Also, learn the accepted common name for each species you identify.

Meeting 7 How Trees Are Classified

Trees can be divided into two large groups by types of leaves. These groups are *broadleaf* and *conifer*. Broadleaf trees have thin, flat leaves. Maples, lindens, oaks and cottonwoods are examples. Most conifers have leaves that are quite narrow and long. Such leaves commonly are called needles. Others have small scalelike leaves and some are awl-shaped or short and pointed like the end of a pin. Pines, firs and spruces are examples of conifers with needle-like leaves. Arborvitae or white-cedar and junipers such as red cedar mostly have scalelike leaves but some trees may have awl-shaped leaves. Sometimes, the scalelike and awl-shaped leaves are found on the same tree.

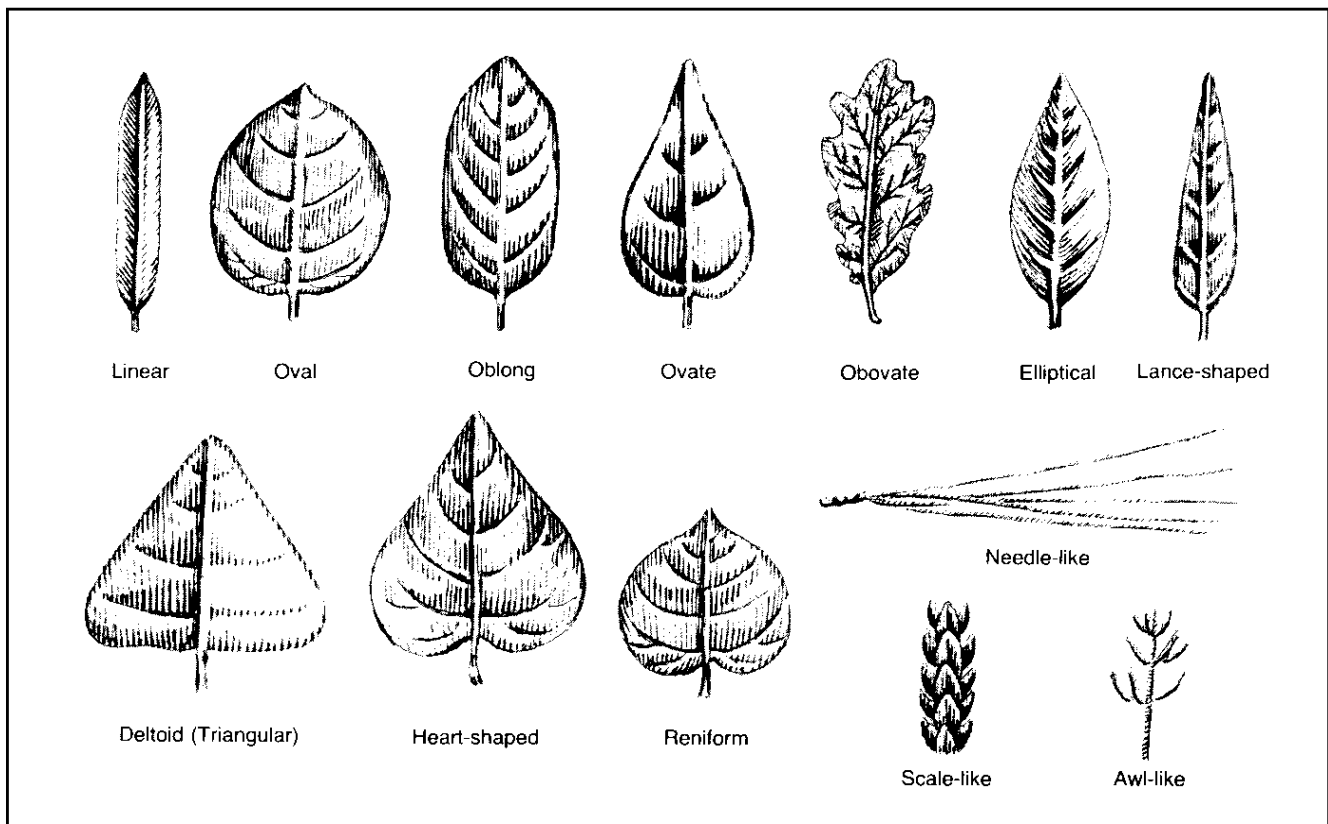


Fig. 12 - Shapes of leaves

Usually, the wood of broadleaf trees is more dense than that of conifers. Because it is more dense, it is harder. This has led to the use of two other terms for classifying trees: *hardwoods* and *softwoods*. All broadleaf species are called hardwoods and all coniferous species are called softwoods. This does not mean that the wood of any broadleaf tree will be harder than the wood of all conifers. For example, the wood of aspen (a broadleaf tree) is not as hard as the wood of western larch, a conifer. Figures 16 & 17 show

how the structures of hardwood and softwood are similar and yet different.

Trees also are placed in two large groups on the basis of leaf-holding. Trees that shed their leaves during fall or winter are called deciduous. Trees that hold their foliage through two or more growing seasons are called evergreen. Most conifers are evergreen and most broadleaf species are deciduous. Therefore, the word *evergreen* is used sometimes to mean conifer or

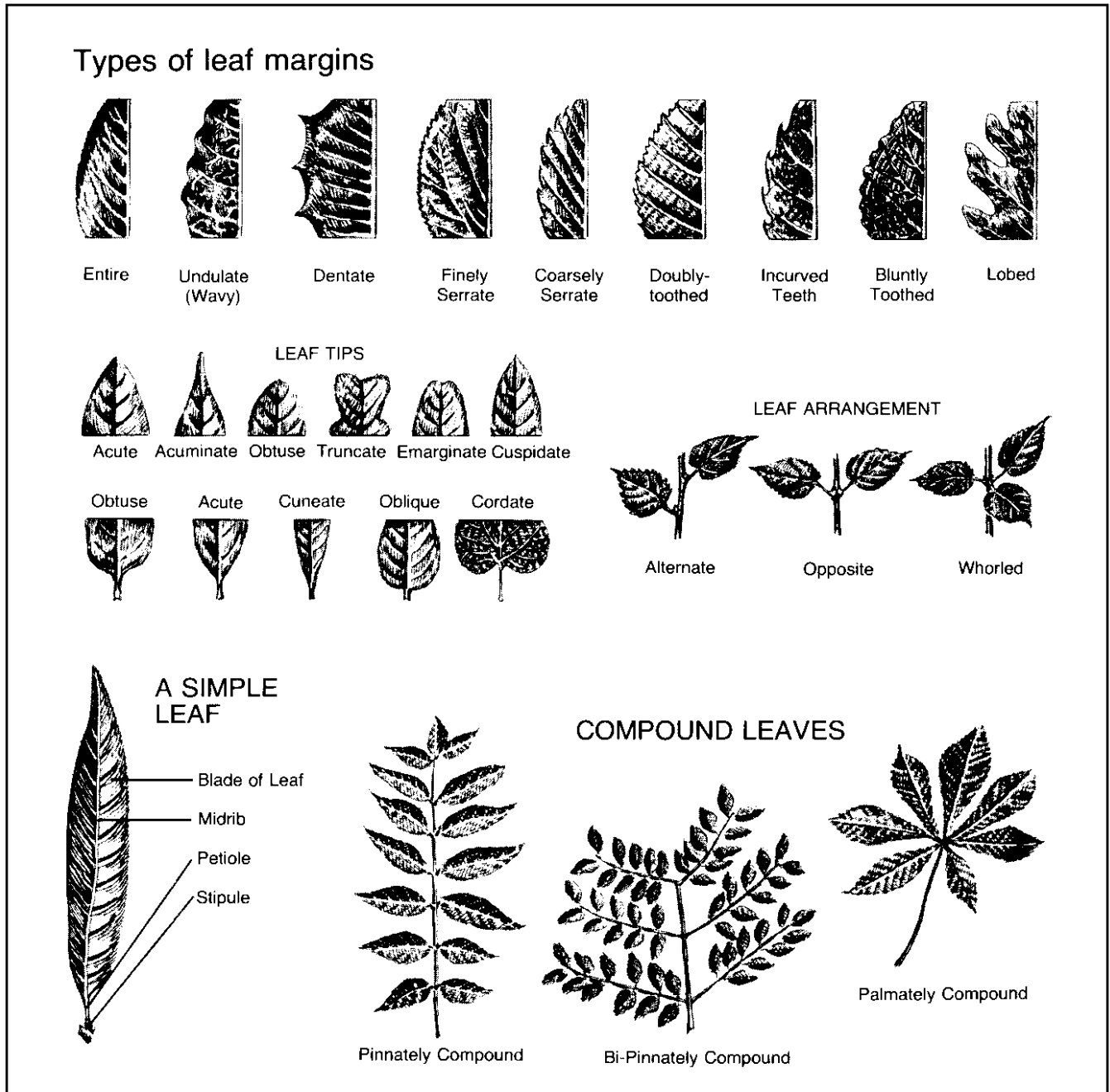


Fig. 13

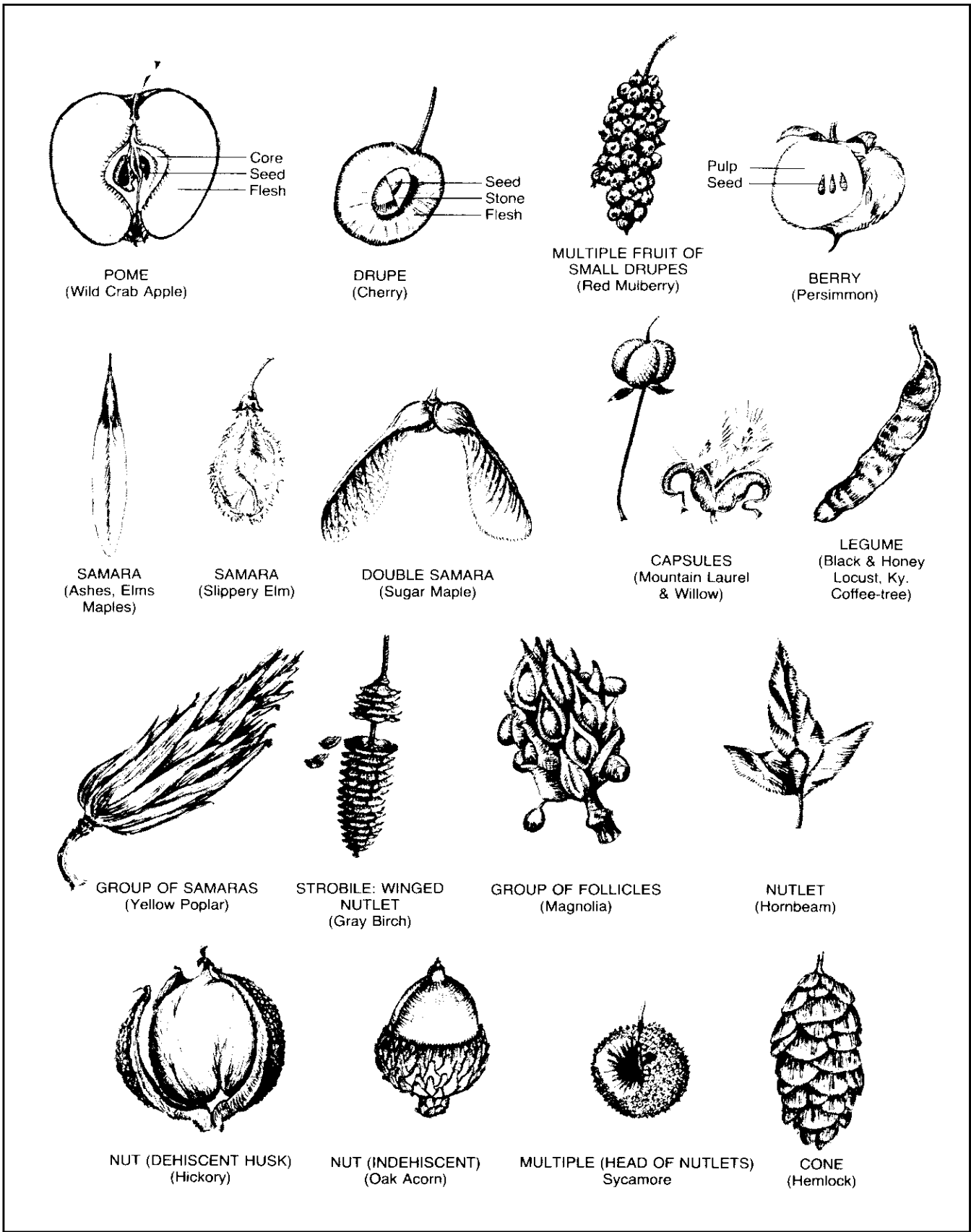


Fig. 14 - Types of tree fruits. The type of fruit a tree bears is often used to identify the tree.

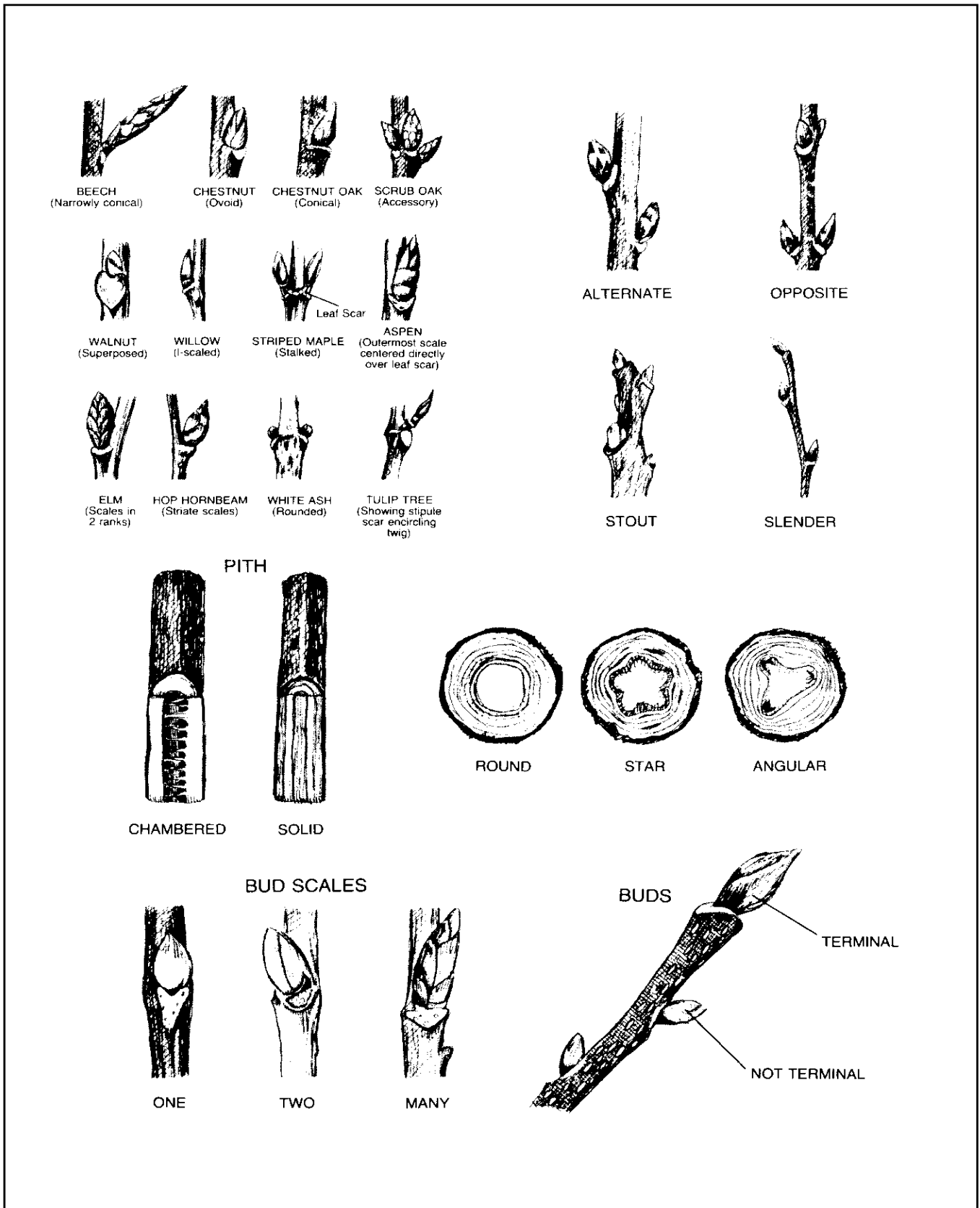


Fig. 15 - Types of tree buds. Knowing bud characteristics is especially helpful during the winter when there are no leaves on deciduous trees. Leaf scars are also useful aids.

softwood. And, deciduous may be used to mean broadleaf or hardwood. However, this is not accurate usage because there are some conifers that are deciduous (western larch, tamarack, and baldcypress). There are some broadleaf trees that are evergreen (live oak, laurel).

Trees that have similar characteristics and show close relationship to each other are called a species. Closely related species form a *genus*. All the genera (plural for genus) that are closely related make up a family. This is a scientific system of classifying trees and all other plants. The system of plan is given below.

Within the broadleaf group:

FAGACEAE, Beech family.

Example of genera: *Fagus* L., beech; and *Quercus* L., oak

Examples of species:

Fagus grandiflora Ehrh., American beech

F. sylvatica L., European beech

Quercus velutina Lam., black oak

Q. garryana Dougl., Oregon white oak

NOTE: Scientific names of plants and animals are always set in italics or underlined. If a second species of a genus is named, the generic name need not be repeated but can be abbreviated by its first letter, as shown above for *Fagus sylvatica* L. and *Quercus*

garryana Dougl. The initials, abbreviations or names that follow a scientific plant name indicate who first described the species.

Within the coniferous group:

PINACEAE, Pine family

Examples of genera: *Abies* Mill., fir; and *Pinus* L., pine.

Examples of species:

Abies balsamea (L.) Mill, balsam fir

A. procera Rehd., noble fir

Pinus echinata Mill., shortleaf pine

P. monticola Dougl., western white pine

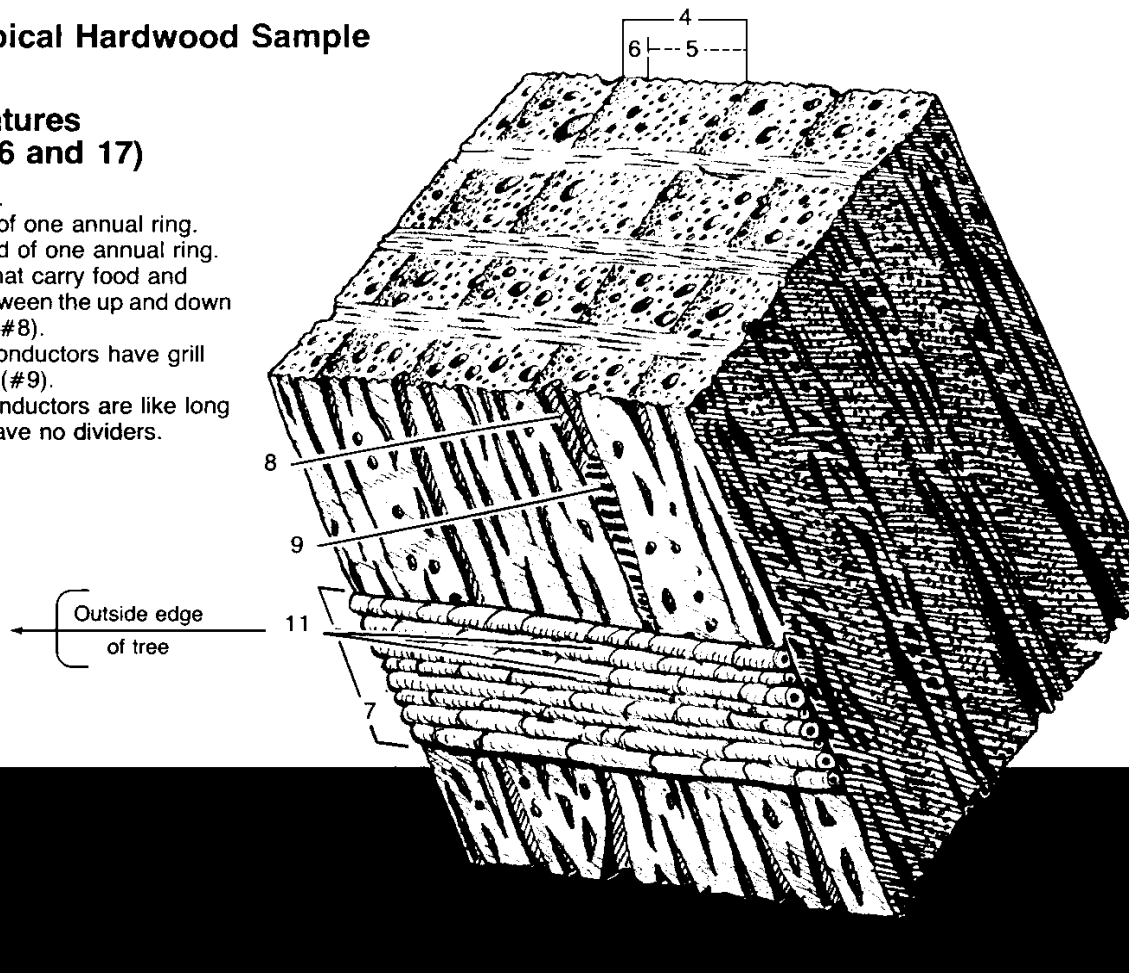
Common names for trees sometimes cause confusion. For example, balsam fir is the accepted common name for *Abies balsamea* (L.) Mill. But, balsam fir is also used by many people as a common name for *A. concolor* (Gord., and Glend.) Lindl, which is white fir, for *A. grandis* (Dougl.) Lindl., grand fir, and for *A. lasiocarpa* (Hook.) Nutt. var *lasiocarpa*, subalpine fir.

The same common name may be applied to more than one species. Also, there are many examples where several names are applied to the same species. For example, *Pinus banksiana* Lamb. is a species that ranges south from Canada into the Great Lakes region and the New England states. It has the accepted common name of jack pine. But, jack pine also is

Fig. 16 Typical Hardwood Sample

Somewhat Similar Features (for Figs. 16 and 17)

- 4 - annual rings.
- 5 - springwood of one annual ring.
- 6 - summerwood of one annual ring.
- 7 - wood rays that carry food and nutrients between the up and down conductors (#8).
- 8 - Hardwood conductors have grill like dividers (#9).
- 9 - Softwood conductors are like long tubes and have no dividers.



called scrub pine, banksiana pine, black pine, and gray pine.

There is usually a good reason for using a local tree name. For example, people in the northern panhandle of Idaho have seen abandoned fields taken over by *Pinus contorta* var. *latifolia* Engelm. This tree is known as the Rocky Mountain lodgepole pine. It grows "thick as hair on a dog's back." People in Idaho use the name of the "dog hair pine."

The scientific naming of plants was developed so that each kind of plant would have only one name. This was to avoid the confusion caused by calling two or more kinds of trees by the same name. Having several names for one kind of tree can be avoided. We should learn to use the scientific names.

For example, you can learn to identify *Juniperus virginiana* L. Then, no matter where you go or whom you might see, anyone else who knows *Juniperus virginiana* L. would know the same tree species that you do.

Scientific names are taken from Latin. Sometimes Latin is called a dead language because it is no longer the spoken language of any people. Therefore, it will not be changing with use. People all over the world can learn the

Latin (scientific) names for trees. They know the names will stay the same. Other plants and all animals have scientific names, too.

Things To Do

6. Visit parks, woodlands or forests. Practice identifying trees and shrubs as broadleaf or conifer. Try learning five new trees in each group.

7. Make an exhibit that will show the major differences between broadleaf trees and conifers. Also, have the exhibit display some major groups of available broadleaf trees (e.g., oaks, hickories, maples) and conifers (e.g. pines, arborvitae, junipers).

8. Make a display that shows three important differences to separate hardwoods from softwoods.

9. Give an illustrated talk that points out the confusion and misunderstanding that can result from use of common names for trees.

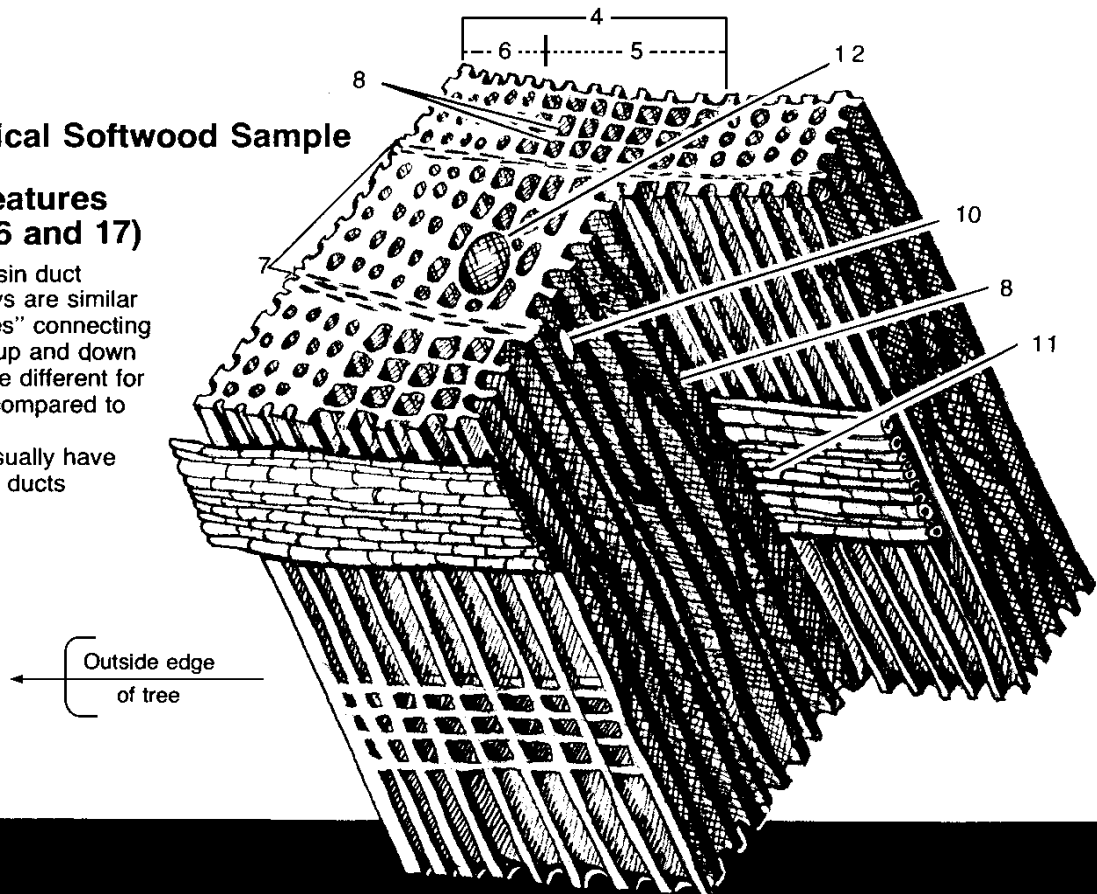
10. Give an illustrated talk or prepare an exhibit to show how scientific names for trees overcome the difficulties often encountered in the use of common names.

11. Learn the scientific names for 10 trees that grow in your area.

Fig. 17 Typical Softwood Sample

**Different Features
(for Figs. 16 and 17)**

- 10 - horizontal resin duct
- 11 - the wood rays are similar but the "holes" connecting them to the up and down conductor are different for hardwoods compared to softwoods.
- 12 - softwoods usually have vertical resin ducts



Meeting 8

Making a Collection of Tree Mounts

Make a good collection of tree identification mounts. It will help you stay well acquainted with your tree friends. It also will enable you to help others learn about trees and what they do for people.

There are five steps in making a collection of high quality tree identification mounts:

1. Gather good materials
2. Keep them fresh before pressing
3. Press them to retain fresh, natural appearance
4. Mount them securely and attractively
5. Protect them against breakage

Gathering materials - A collection of mounted tree parts can become an identification aid. It has the highest value if each mount presents as many identifying characteristics as possible. So, in addition to leaves, you may collect fruits, flowers, bark and twigs whenever possible. Try to collect other tree parts that are very helpful in identifying the species. For example, Douglas-fir's distinctive cone parts, called bracts, are an especially helpful identification aid. For trees with cones, a whole cone need not be mounted. You could use half a cone. Or, you may take a cone apart and get only some of the scales for mounting. Identification aids that are hard to get or bulky can be sketched on the mount card to one side of the leaves.

Collect leaves in the early summer after they are fully grown. Too young and too small leaves may not be of the size that is representative of the species. Also, pressed young leaves turn dark because of their high moisture content. If collecting is delayed until later summer, find leaves that have not been damaged by sun, insects, diseases or pollutants. Avoid damaged leaves. Leaves from suckers, sprouts and seedlings usually are oversized and do not truly represent the species.

Twigs of deciduous species should be collected in winter or early spring. This is while the trees are bare. Flowers should be collected when fully developed. Also, fruits should be mature or nearly so. Select mounting materials that appear to be most representative of the species.

You may use 8 1/2" x 11" (22 cm x 28 cm) paper or cards to make your mounts. The sizes of the specimens you select should fit the size of the mounting sheet. Large flowers or fruits, thick bark or heavy twigs may be better sketched than mounted. This is due to the difficulty in mounting

such bulky objects. Sometimes it is better to make fairly thin crosssections or longitudinal sections of cones, nuts, twigs or bark. Then, use these sections on the mounts.

Keeping Your Materials Fresh - Leaves and flowers are your main concern. A good way to keep such materials fresh is to have a press that you can carry along on collecting trips. Then as you collect materials, put them in the press before they wilt.

If you go collecting before you have a press, use one of the following methods to help keep your materials in good condition until they can be put to press:

*Take along one or two magazines and some paper towels. Carefully place specimens between paper towels in the magazines. Keep them there until they can be pressed. This method is improved if two pieces of stiff cardboard are used for support. Keep the magazine(s) between the cardboards. Use two or three strong rubber bands to hold the packet together.

*Cut several pieces of cardboard 9" x 12" size (or 24 cm x 30 cm). Place paper towels or sheets of newspaper between them. Put collected specimens between the towels or newspaper. Hold the packet together with two or three stout rubber bands.

*Use a covered cardboard, plastic or light metal box of convenient size. Place specimens on a moist sponge or newspaper in the box as they are collected. Keep the box in the coolest surroundings possible until the specimens can be placed in a press.

Pressing Specimen for Natural Appearance - The first condition is a satisfactory press. An easily made press is the cardboard press described under Keeping Your Materials Fresh. Use corrugated cardboard and cut the pieces so that all corrugations run the same direction. If possible, obtain enough blotting paper to have at least one sheet for each plant that is expected to be in the press at any one time.

Put the plant specimens between sheets of newspaper. Then, place a blotter between each two plants. Insert a cardboard every third or fourth plant. Use large rubber bands or straps with rubber sections inserted to hold the press packet together. When the press is loaded, place it where it will stay dry and warm and will have good air circulation around it. Place the press on a hard surface with considerable weight on top. About 50 pounds or 25 kilograms is recommended. This weight can be anything handled easily. Use weights such as a box of rock, sand, bricks, wheel weights or metal scrap.

Another press is the wooden frame press. The

inside of a wooden press can be identical to the cardboard press described above. The wooden frames with good binders take the place of the weight. The best binders are adjustable canvas straps with attached binding devices. A press can seldom be cinched tightly enough with string, rope, or rubber band binders. With these, use additional weights on the press.

Place fresh plant materials in the press. Read carefully the section about keeping tree leaf specimens fresh. You may go on a collecting tour and be unable to take your plant press. If so, do your collecting as late in the tour as possible. That will give your plant materials less time for wilting before you get them into your press.

The next step is placing each specimen in the press carefully. A specimen's arrangement cannot be changed after it is pressed. Do not fold leaves. Make them lie flat. If they are all attached to a twig, be sure at least one is turned so that its under surface shows. Avoid putting bulky twigs, flowers and fruits in the same press with the leaves. If bulky parts need to be pressed, place them in a second press. Twigs and many tree fruits need not be pressed. They may be cured or dried out by keeping them in a dry place.

Remember, each specimen should be placed between sheets of newspaper. It is best to place each between blotters. Use a piece of corrugated card board every third or fourth

Fig. 18

Compare the size and longevity of MAN to

Largest land animal-Elephant
12 feet tall

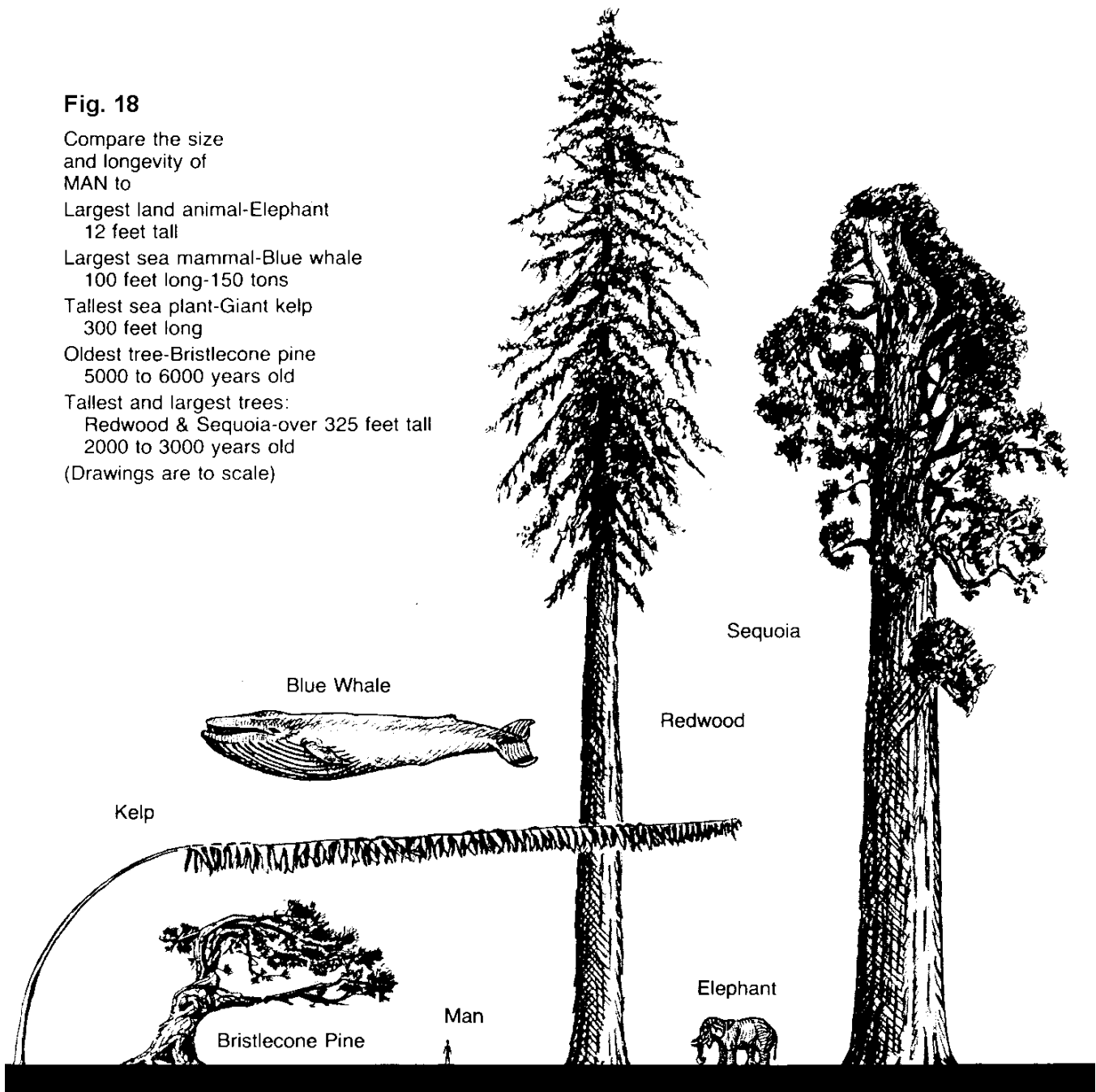
Largest sea mammal-Blue whale
100 feet long-150 tons

Tallest sea plant-Giant kelp
300 feet long

Oldest tree-Bristlecone pine
5000 to 6000 years old

Tallest and largest trees:
Redwood & Sequoia-over 325 feet tall
2000 to 3000 years old

(Drawings are to scale)



specimen. Be sure to use enough binder pressure or weight to press materials flat. This keeps leaves from wrinkling.

Allow a week to ten days for pressing. A good idea is to open up your press two days after putting in the specimens. If you have extra blotters, then change the blotters in your press. If not, then carefully change the newspaper sheets. Let your blotters dry as much as possible while the press is open. In pressing, the moisture in the plants is absorbed by the papers and blotters. If the papers and/or blotters are not changed, some of the leaves may turn black. One change of papers or blotters is usually enough, unless you are pressing some fairly large specimens with succulent leaves or fruits.

Mounting the Pressed Specimen - Pressed specimens are to be attached to the mounting cards. A good way is to spread a common white glue on the back or underside of each specimen. With the glue surface downward, place the specimen in the exact position desired on the mount card. Lay a sheet of wax paper over it. Place on top of the wax paper a 11 pound or 5 kilogram bag of sand. The bag should have enough slack in it to allow spreading over the entire specimen. A stack of books or catalogs might be used. Let the weight and wax paper remain until the glue has dried. Clear tape can also be used. Masking tape or rubber cement may be used on paper or cards, too.

Protecting the Mounted Specimens - Now you have collected, pressed and mounted specimens. Those are attractive tree identification aids. You need to protect them from damage that might result from being scuffed, crushed or bent. Follow these suggestions.

You may wish to purchase acetate or cellophane sheet protectors for notebook size or 8½ x 11 inch sheets. Usually two mounts can be turned back to back and still place them in one cover. You may use a plastic kitchen wrap to cover the mount but it is not quite as good. The wrap can be taped down on the back if it is not the kind that will stick to the card.

A stiff-backed 3-ring notebook cover gives good protection against bending and crushing. Flexible 3-ring covers are not as good as the stiff ones. Mounts may be bound with string, leather thongs or metal rings. If covers are made only of heavy paper or thin cardboard, such binding offers little protection.

Things To Do

12. Make a plant press.
13. Prepare an identification mount for each of 10 trees you have learned to identify.
14. Demonstrate how to collect, press and mount good materials to make a helpful tree identification aid.

Other Things To Do

Here are some other interesting things to do that are related to this lesson. Try some of them.

15. Make leaf prints of leaves from five different tree species. Use a method that makes a true leaf print rather than a mere leaf outline.

16. Make a special study of one tree species and report on it to your club.

17. Label different kinds of trees in a park or other area where visitors may easily see them.

18. Prepare a chart with a key of 10 common trees in your area.

19. Help your club plan and conduct a tree identification contest. Develop rules on how the contest will be run and scored. Participate in the contest.

20. If your county has a tree identification contest, take part in it. If there is no county contest, see if you and other members in your club can get one approved and perhaps sponsored.

21. Plan and conduct an educational program to get people of your community to identify the most common trees of the area. Perhaps a local newspaper would be willing to publish a series of articles from your club that would tell how to identify local trees. Tree identification exhibits may be placed in store windows. Illustrated talks may be given before garden clubs, members of youth organizations, and other groups. Drawings, color slides and identification mounts (or a combination) may be used in these talks. As a conclusion to the program, the newspaper might agree to publish a tree identification contest (small sketches of identifying characteristics, plus some descriptive phrases) for 10 or 20 trees in the community and announce the results.

22. Construct a battery-operated display panel. People at a fair or other gathering can use the panel for testing themselves on tree identification. (NOTE: This is a device that displays mounted tree identification aids with electrically wired racks. Switch buttons and names of the species are displayed. People then see if they can identify trees. A correct identification gets a green light, an incorrect answer trips a buzzer or bell. Make the display to hold 10 specimens.)