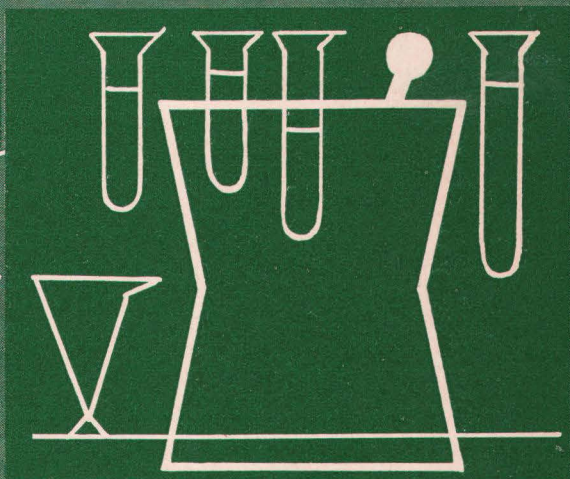


The Forest and the Druggist



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This bulletin was prepared by C. Ralph Voris, assistant public relations director, Oregon State Forestry Department as a revision of the drugs section of the publication Secret Treasures in the Forests which has been discontinued. Acknowledgment is made to the original editor Lynn F. Cronemiller, former public relations director, State Forestry Department. The assistance of many other persons in checking the manuscript and making valuable suggestions is also acknowledged. Among these were Dr. Roy Young, Jr., Kenton Chambers, and Warren P. Randall of Oregon State University.

The Forest and the Druggist

The forests of Oregon and Washington contain many plants with medicinal values. Though the economic importance of these plants has declined over the years, there is still a limited demand for their use. Most important is the half million dollar cascara industry. Minor markets exist intermittently for other crude drug materials, including Prince's pine (common pipsissewa), Oregon grape, foxglove, wild ginger, and Douglas-fir pitch.

Other species by the hundreds, from the white fir tree to skunk cabbage and even poison oak are credited from one source or another with medicinal properties. Historical records indicate their use with varying degrees of success by the early inhabitants of the Pacific Northwest. A surprisingly large number of these plants are potentially poisonous depending upon the strength of the dosage used. It is therefore suggested that a little knowledge in this field can be dangerous and that the preparation of drugs be left to

pharmaceutical companies.

Cascara sagrada (*Phamnus purshiana*, De Candolle) came to the knowledge of the white man when members of the Lewis and Clark expedition noted it "on the banks of a tributary of the Columbia River." Old documents indicate that "without doubt this species was first used by the American Indian from whom its virtues were learned by the Spanish priests of old California." Thus its common name, cascara sagrada (sacred bark) is of Spanish origin and it was so named because the wood was supposed to be identical with the "Chittim" wood used in the Arc of the Covenant.

Cascara was introduced into the medical profession in 1877 and quickly attained popularity. It was said that cascara sagrada used as a cathartic had no peer. Within the last decade its need has gradually been reduced by the use of fresh fruits and vegetables that have become available throughout the year.

The Cascara Tree

The cascara tree is limited in its commercial range to northwestern California, western Oregon and Washington, and southern British Columbia. By far the largest percentage of bark is gathered in western Oregon and Washington, as it is here that the tree at-

tains its best development and is found in greatest abundance.

The tree grows to a height of 20 to 40 feet with a diameter of 6 to 15 inches. Exceptional trees have been found to be as much as 2 to 3 feet in diameter and 60 feet tall. When

open grown, cascara has a short trunk and a bushy crown. When it has to meet the competition of other trees it has a clear trunk and small crown.

The cascara tree is not difficult to identify. The full-grown leaves are distinctive and although they resemble red alder to some extent, they are more oblong in shape and a somewhat darker green. The edges of cascara leaves are very finely toothed while alder leaves have large blunt-toothed edges. The veins of the cascara leaf are very prominent, remarkably straight, and parallel to each other. The fruit is a small, black, pulpy berry (drupe) that contains two or three hard, smooth, olive-green seeds.

In the winter, with the absence of leaves and fruits, the tree can be most readily identified by the large terminal buds which have no protective scales. The embryonic leaves are thereby exposed, giving the impression that they are just breaking out for their initial spring growth. Also the fine venation in these small, dark-brown leaves can be readily detected. Another distinct identifying feature is the yellow color of the freshly cut bark and its bitter taste.

Cascara trees make their best growth in low river bottoms, along the borders of streams, and on flats and benches where the soils are deep, rich, and sandy or humus.

Cascara Supply and Demand

The market price for dry cascara bark has fluctuated greatly over the past years, ranging as low as 6 cents a pound in about 1940 to as high as 30 cents in 1947. The 1957 price was around 20 cents per pound (dry weight), which would indicate either a downward trend in the market or an oversupply of bark. This trend is further emphasized by the fact that the 1947 total annual production of cascara bark was 5 million pounds and in 1957 the annual production was about 2 million pounds. It would appear that present annual requirements

are being well supplied, contrary to predictions made some years ago that the natural supply of cascara bark would not be adequate.

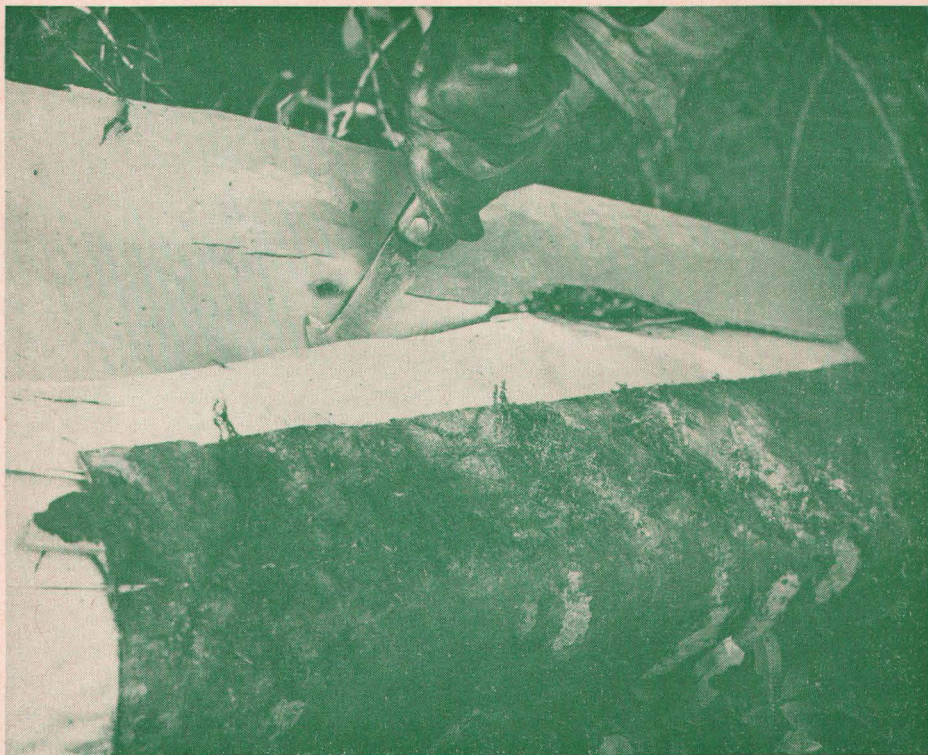
Bark may be sold either wet (green) or dry. The weight of dry bark is about 50% less than that of wet bark and the price is about 3 to 1. While dry bark is selling for around 20 cents per pound, the price of green bark runs from 5 cents to 8 cents per pound. The purchaser of green bark must not only consider the loss of weight but also the added cost of drying, breaking, and sacking.

Harvesting Cascara Bark

The season for collecting cascara bark varies somewhat according to location and elevation, but it usually starts in April and may continue as late as August. During this time the

trees are in full leaf and the sap most active, which accounts for the relative ease with which the bark will slip in the peeling operation.

Trees should be felled before peel-



A "spud" is used to peel cascara bark from the felled tree. This tool has a recurved point for use in splitting the bark vertically and around the trunk.

ing, leaving an unpeeled stump cut to a height of about 6 inches with a smooth, sloping top surface to shed rain and retard decay. This practice is essential if the tree is to live and produce new sprouts to provide for a crop some 10 to 15 years later.

It is not desirable to peel trees under 4 or 5 inches in diameter as the bark is quite thin and consequently lighter in weight. A tree of this size is growing bark at a maximum rate and to cut it would be to harvest the crop prematurely. On the other hand, limbs and branches of the felled trees should be peeled down to a diameter of 1 inch for complete utilization.

Often the bark is covered with moss and lichens and they should be removed since clean bark is more salable. The bark can be cleaned by scraping with the peeling tool before it is removed from the tree, or by rubbing the trunk and limbs with a gunnysack.

In removing the bark, various types of knives or "spuds" are used. One of the most acceptable is made of spring steel and has a blade about 7 inches long with a 5-inch handle. The blade is a little over an inch in width. The end is rounded with a recurved point at one edge of the rounded point. The sharpened point is used for splitting bark vertically to the trunk of the

tree and also horizontally so that it can be removed in sheets about 2 feet or so in length. The rounded end and the blade of the spud are used to pry the bark loose.

Good peelers, under favorable conditions, can peel from 100 to 250 pounds of dry bark per day. In terms of wet bark this weight should be doubled.

Bark should not be collected during rainy weather because drying is difficult and staining or blackening often results. Wet bark moulds quickly and results in serious loss in grade. Bark is normally cured in the open, spread out on a canvas or platform with the inner bark placed face down. Cascara bark must be covered during the night if there is a heavy dew, and at all times

during rain. Properly dried bark has a clear-orange or golden-yellow color and yields the highest percentage of chemical content. Four days of sunny weather will suffice for drying. In testing for dryness, the bark should snap with a clean fracture. Curling bark is the result of drying.

After the peeling season is over the dried bark should be broken into small enough pieces for sacking and placed in ordinary burlap sacks for sale and shipment. From 50 to 75 pounds of dried bark can be put in a sack. The bark is easy to break up and it does not deteriorate with age. If the price drops during the season after harvest, bark can be stored until the price is right.

The Cascara Plantation

Although at present it appears that the demand for cascara is being adequately supplied by its voluntary growth in forests, this might not always be the case. Certain people with favorable circumstances might find it profitable to grow a domestic supply of cascara. Thus a guide for planning a cascara plantation is needed.

The cascara grower should bear in mind that he is going into a project that is to carry over for a period of not less than 12 to 15 years before he gets a return on his investment. Initial costs and annual carrying charges are just as great on poorer sites as on good ones. The choice of a location, together with subsequent care, can mean the difference between a profit and a liability.

The plantation can be started either from seeds or through purchase of 1-year-old seedlings from the State Forestry Department. Starting from seed

or seedlings can be secured by going is not generally recommended for the amateur, since the seeds are rather difficult to handle and germination is quite low. However, if seed is to be planted the berries should be gathered in the fall when they are ripe—some-time in August or early September.

Berries can be either dried or depulped in water. Treatment during winter consists of stratification in moist sand. The berries should be planted in a garden spot in the spring, rather thickly in rows, with the rows 18 inches to 2 feet apart. They should be weeded, cultivated, and watered throughout the summer. During the winter or early in the following spring, before the growth starts, they should be planted at the site of the permanent plantation.

By far the easier method is to secure seedlings from the Oregon forest nursery near Corvallis. A card to the state forester at Salem will bring a tree planting bulletin and an order blank,



Cascara seedlings are available for planting from the Oregon State Forestry Department nurseries.

directly to the nursery. Frequently demands exceed the supply of seedlings and in such instances supplies are rationed. For this reason it is advisable to place orders early in the fall. However, production is being stepped up and it is expected that the state nursery will be able to meet all normal demands in the future.

The minimum spacing recommended for field planting is 6 by 6 feet which would require 1,200 trees per acre. Closer spacing than this tends to crowd trees and restrict their growth. If plenty of space is available, the trees may be planted either 6 by 8 or 8 by 8. Wider spacing contributes to ease of cultivation where mechanical equipment is used.

Since young cascara trees grow very slowly in the shade, steps should be taken to cultivate the plantation prior to planting. If this is difficult because

of rocks, stumps, or other obstructions, brush and other growth should be removed around each tree and the tree mulched. After trees get above the low growth of ferns, grass, and shrubs they do not require much care other than protection.

Care of the plantation

Care in the early stage is important. The grower must not take the attitude that "this is just another forest tree" and that it will make good growth under the same conditions it would in the forest. This definitely is not so. The cascara farmer must realize that a new plantation—at least in its early stages—should receive care that approaches that given a young fruit orchard. This care pays dividends in accelerated growth.

Some pruning of lower branches

may be necessary for the first few years to produce long, clean-boled trees. If these branches are left, too much growth will develop laterally at the expense of height. Pruning will also allow more room for cover-crop cultivation.

Fire and trespass are two threats to the cascara plantation. Every precaution should be taken to prevent fires. Good firelines should be constructed around the area, and if it is of any considerable extent it should be broken into blocks. Cascara bark is quite attractive to trespassers, especially during years when prices are high or when there is a depression and jobs are scarce. For this reason plantations should be near habitations where they can be watched.

All kinds of stock find cascara quite palatable and hence the plantation cannot be grazed. It is questionable whether it can be grazed even after the trees reach a size where they are not damaged by browsing. Trampling the ground tends to damage trees and slow down their growth. Cascara should be considered as a single crop and the farmer should reconcile himself to the fact that multiple-use is not possible.

In areas where deer are plentiful the grower will definitely run into trouble and the project may even have to be abandoned. Deer repeatedly browse tender shoots and branches. Only a deer-proof fence will keep them out and this is a costly project. It requires a 4-foot hog-proof fence with several strands of barbed wire above.

Another threat to the plantation is the mountain beaver or boomer, a rodent of a social nature that lives in the ground and is found widely scat-

tered throughout the range of the cascara. This animal will cut all trees in the plantation and drag them to his underground den. Cascara plantations should not be established in or near one of these beaver colonies. Since these colonies are somewhat migratory with the seasons, they may invade an established plantation. They can be trapped by placing steel traps in their dens. Some research work has been carried on in control by poisoning, but a successful formula has not yet been developed.

Complete information as to the amount of bark that can be expected from a plantation is not available. Most data have been secured by peeling native trees. This would result in a lower production figure since native trees are grown under somewhat adverse conditions and could not be expected to produce the amount of bark that would come from a plantation. However, it appears that a grower could expect a production of about 12 to 15 pounds per tree over a period of 15 years if his trees have been planted on a favorable site, properly spaced, and given reasonable care during the growing period.

At the time the first crop is harvested, the second rotation can be assured without replanting by following approved methods of peeling. Stumps should be cut to a height of about 6 inches and should not be peeled. The stumps will then put out a number of sprouts and these can be thinned to the two or three that are the most vigorous. At a later period of the rotation, all except one of the sprouts can be removed and peeled. Eventually the area will have to be replanted since stumps lose their vigor through repeated coppice.

The Floxglove Plant

(*Digitalis purpurea*)

Floxglove is the plant from which the well-known heart medicine, digitalis, is derived. Although the present market for this plant is in doubt, it has future possibilities. Floxglove is a native of Europe and was brought to America as an ornamental. Here it escaped from cultivation and is now found throughout the western part of Oregon on open sidehills, creek bottoms, and around meadows.

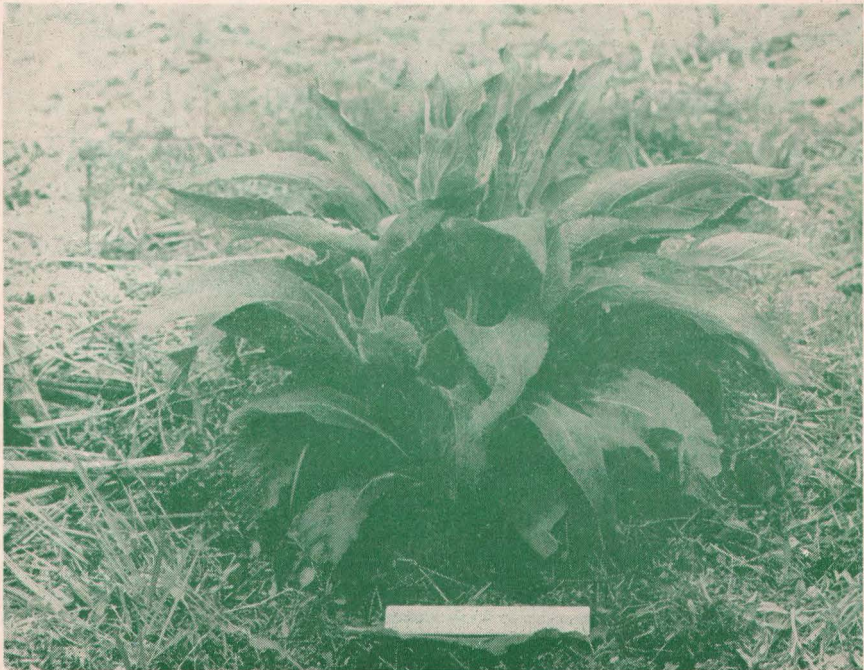
Mature green floxglove leaves should be picked in the spring and fall. They should be cut at the junction of the leaf and stem. Long stems and butts cannot be used. In the late spring

when the center stalk appears, it should be left since it produces flowers and the eventual seed crop.

Leaves are packed in burlap sacks with the picker's name attached for delivery to the nearest plant. They should be taken to the drying plant on the day they are picked. This limits the areas of picking to within a few miles of the market. There are occasions in cool weather when leaves can be stored in shady spots for a day or two without spoilage.

In some years, when there has been a considerable demand, a price of 3 to 4 cents per pound has been paid.

A floxglove plant ready for harvest. The mature green leaves are picked in the spring and fall.



Douglas-fir Pitch

(*Pseudotsuga menziesii*)

Gathering crude pitch from old-growth Douglas-fir of the west coast has been quite an industry in the past, especially during depression days when jobs were scarce. Lately, however, there has been little activity, although the demand remains steady and there is always a market for this product.

Securing the pitch consists of boring a hole low down at the base of the tree and slanting downwards so that pitch may run out. A hollow pipe should be inserted and the pitch caught in a container, usually a 5-gallon tin.

Pitch occurs in pockets or pitch seams in the tree and a single tree

may produce up to 100 gallons of the product, although this amount is exceptional.

Experts are able to pick out with some degree of accuracy the trees that are likely to produce pitch. They consider size, shape of butt, looks of bark, presence of decay, and other exterior appearances. Generally, leaning, swell-butted, wind-blown trees are the best source. Resin should be kept as clean as possible. Prices run about 90 cents per gallon. Fir pitch is processed and used in paints, soap, India ink, for medical purposes, and as a substitute for Canada balsam in optical work.

Miscellaneous Plants

Many other medicinal plants are found in forests. Bark and roots of the false Oregon grape (*Berberis nervosa*) found commonly in coniferous woods are listed as used in the treatment of jaundice.

For many years woodsmen and loggers have crushed the leaf of Prince's-pine (*Chimaphila umbellata*) in water and used it for rheumatism and heart trouble. The leaves of this low evergreen herb, common in deep, dry coniferous woods are said to serve as a tonic, astringent, and diuretic.

Another perennial herb, widely dis-

tributed in moist, shaded forest areas is wild ginger (*Asarum caudatum*). This aromatic plant is said to be effective in gaseous stomach conditions.

Skunk cabbage (*Symplocarpus foetidus*) is a large-leaved herb whose roots form the chief ingredient of the patent medicine "Skookim." Reputed to be a stimulant and emetic, it is said also to have been made into a salve for ringworm and swellings. Enumerable other herbs, shrubs, and trees of the forest are credited with various chemical properties considered of value for medicinal purpose.

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