

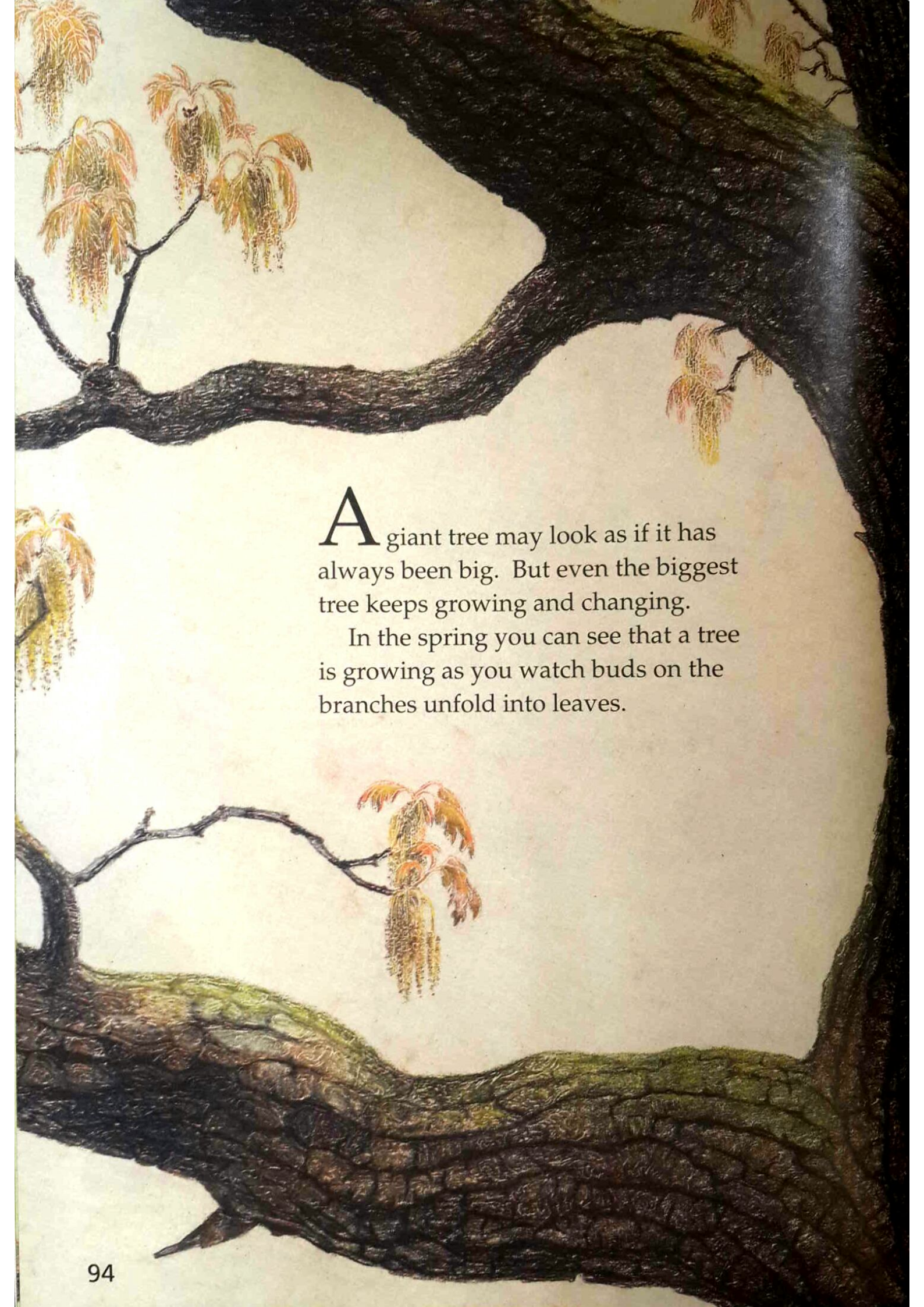


A Tree Is Growing

by Arthur Dorros
illustrated by S. D. Schindler

ESSENTIAL QUESTION

What are some differences among types of trees?



A giant tree may look as if it has always been big. But even the biggest tree keeps growing and changing.

In the spring you can see that a tree is growing as you watch buds on the branches unfold into leaves.



Bristlecone pines are the oldest known living trees on earth. Some have been growing for five thousand years—since before the pyramids in Egypt were built.





White oak

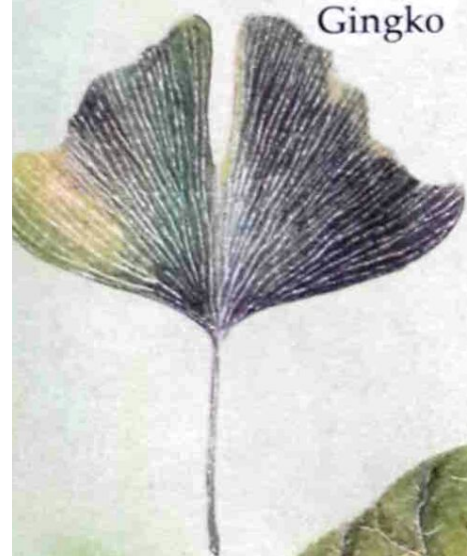


Palm

Leaves can be skinny needles or big heart shapes. Whatever shape or size a leaf is, it makes food for the tree.

A kind of sugar is made in the leaves. Trees use the sugar as food.

Gingko

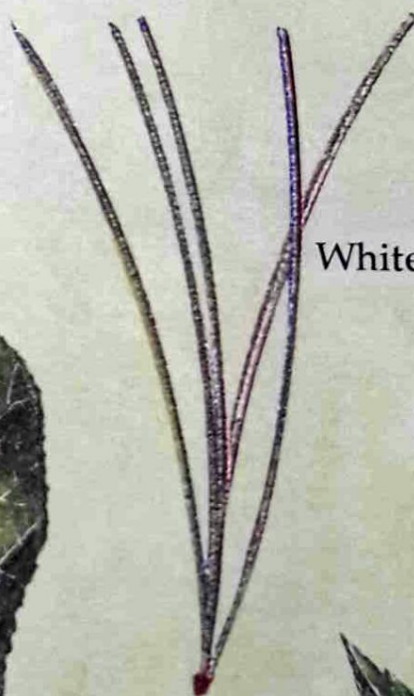


Breadfruit tree

Empress tree



White pine



Red maple





The sugary water made in the leaves is mixed with other tree juices called sap. The food in the sap is carried **throughout** the tree. Where a branch breaks or where bark is cut, sap oozes out of a tree. The strong smells of some saps can keep insects from eating the trees they live on.



If you rub a sassafras leaf, the sap smells spicy.



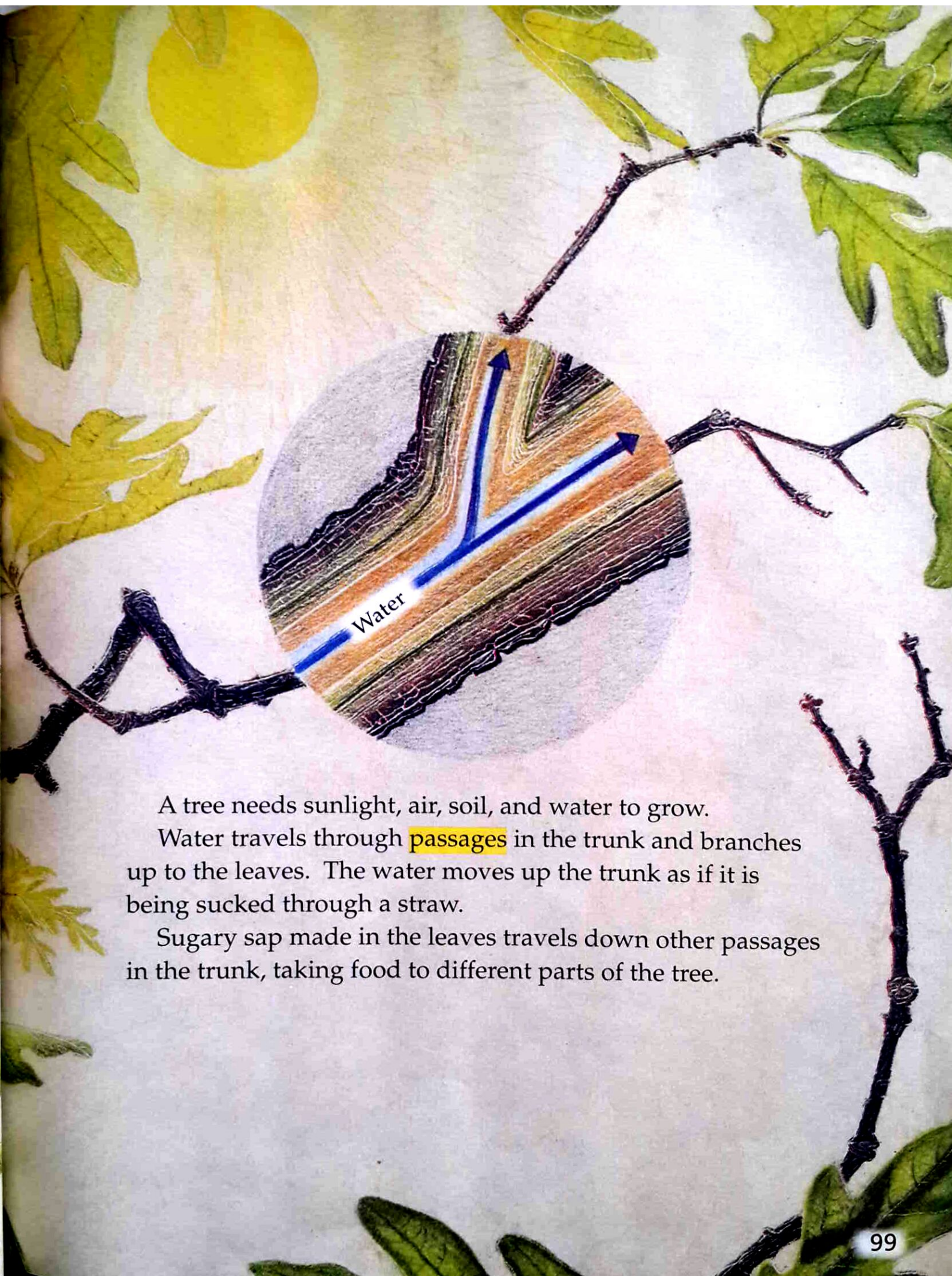
Maple syrup is the boiled sap of sugar maple trees.



Baobab trees store water in the trunks. When a baobab tree trunk is swollen with water, it is round and fat. In dry weather, the tree gets water from the trunk. Then the trunk gets thinner.



Moth caterpillar



A tree needs sunlight, air, soil, and water to grow. Water travels through **passages** in the trunk and branches up to the leaves. The water moves up the trunk as if it is being sucked through a straw.

Sugary sap made in the leaves travels down other passages in the trunk, taking food to different parts of the tree.



A few kinds of trees drop roots from branches into the soil to gather water. Banyan tree roots grow into columns all around the tree.



Growing roots are strong. A root can lift a sidewalk or split a rock as it grows. By splitting the rock, it helps make soil.

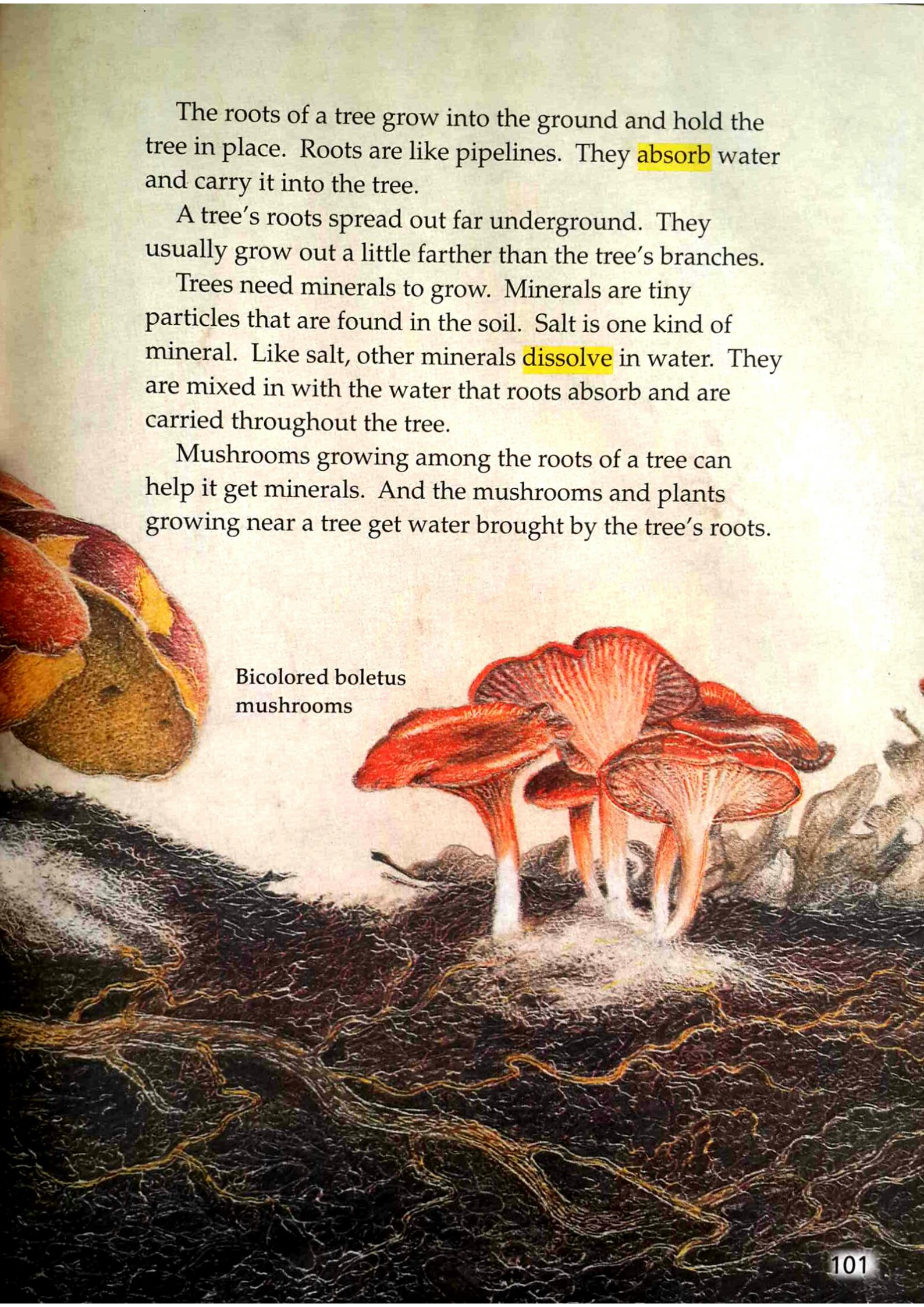


The roots of a tree grow into the ground and hold the tree in place. Roots are like pipelines. They **absorb** water and carry it into the tree.

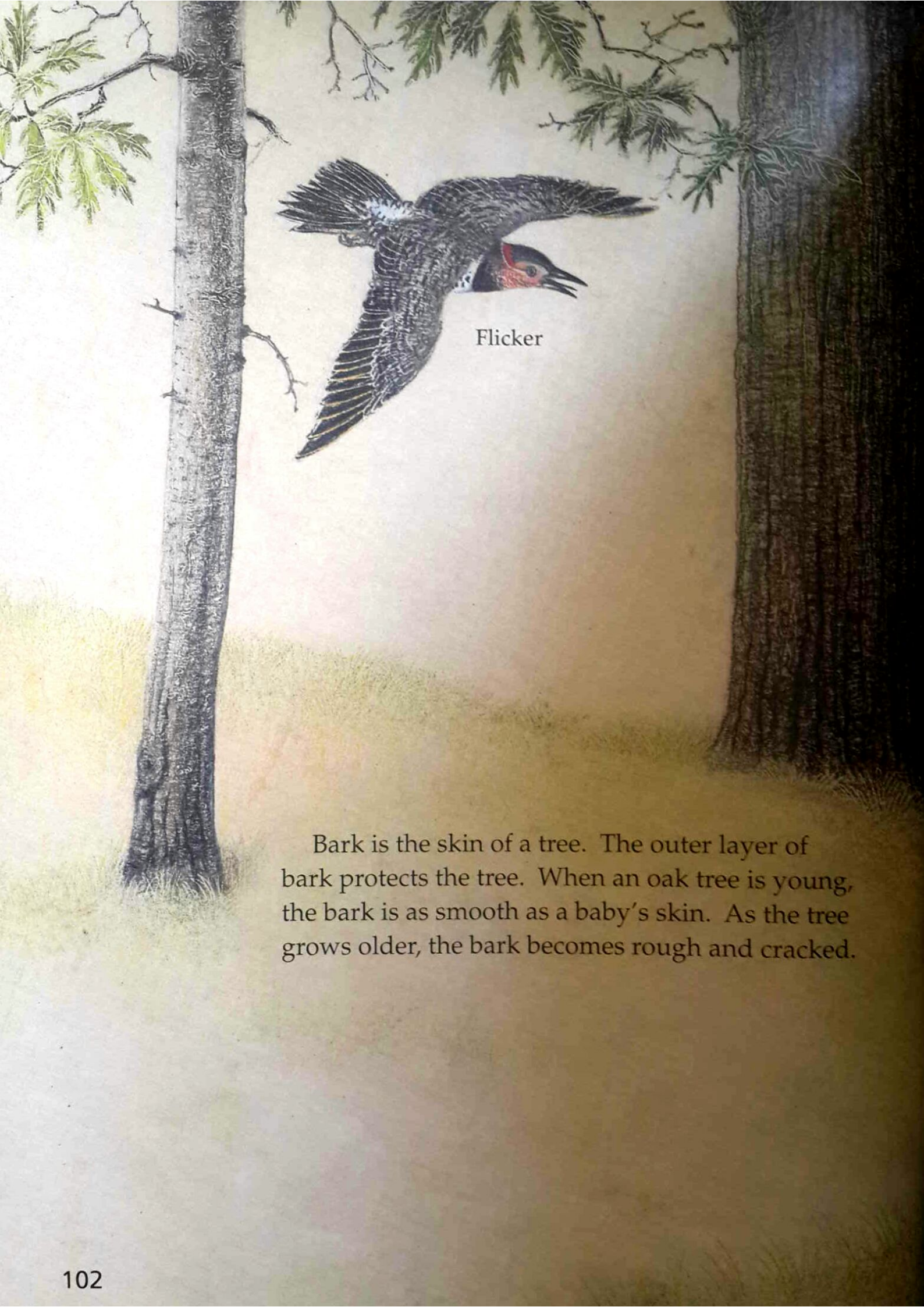
A tree's roots spread out far underground. They usually grow out a little farther than the tree's branches.

Trees need minerals to grow. Minerals are tiny particles that are found in the soil. Salt is one kind of mineral. Like salt, other minerals **dissolve** in water. They are mixed in with the water that roots absorb and are carried throughout the tree.

Mushrooms growing among the roots of a tree can help it get minerals. And the mushrooms and plants growing near a tree get water brought by the tree's roots.

An illustration showing several bicolored boletus mushrooms with bright red caps and gills, and white stems, growing on a dark forest floor. The ground is covered with a dense network of tree roots, some of which are highlighted in a golden-brown color. To the left, a large, textured mushroom cap is partially visible, showing shades of red, yellow, and brown. The background is a light, textured wash of color.

Bicolored boletus
mushrooms



Flicker

Bark is the skin of a tree. The outer layer of bark protects the tree. When an oak tree is young, the bark is as smooth as a baby's skin. As the tree grows older, the bark becomes rough and cracked.

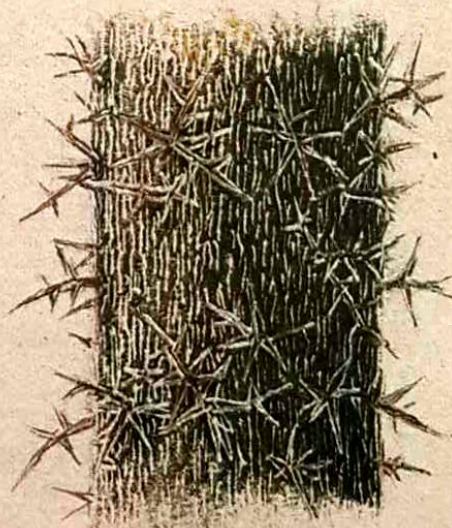
Polyphemus
moth



*Looking at the bark
of a tree can help
you know what
kind of tree it is.*

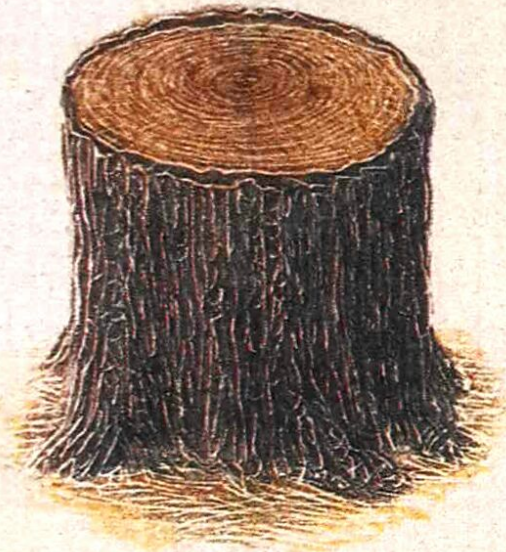


*The cork used for
bulletin boards is
the peeled-off
outer bark of a
cork oak tree.*

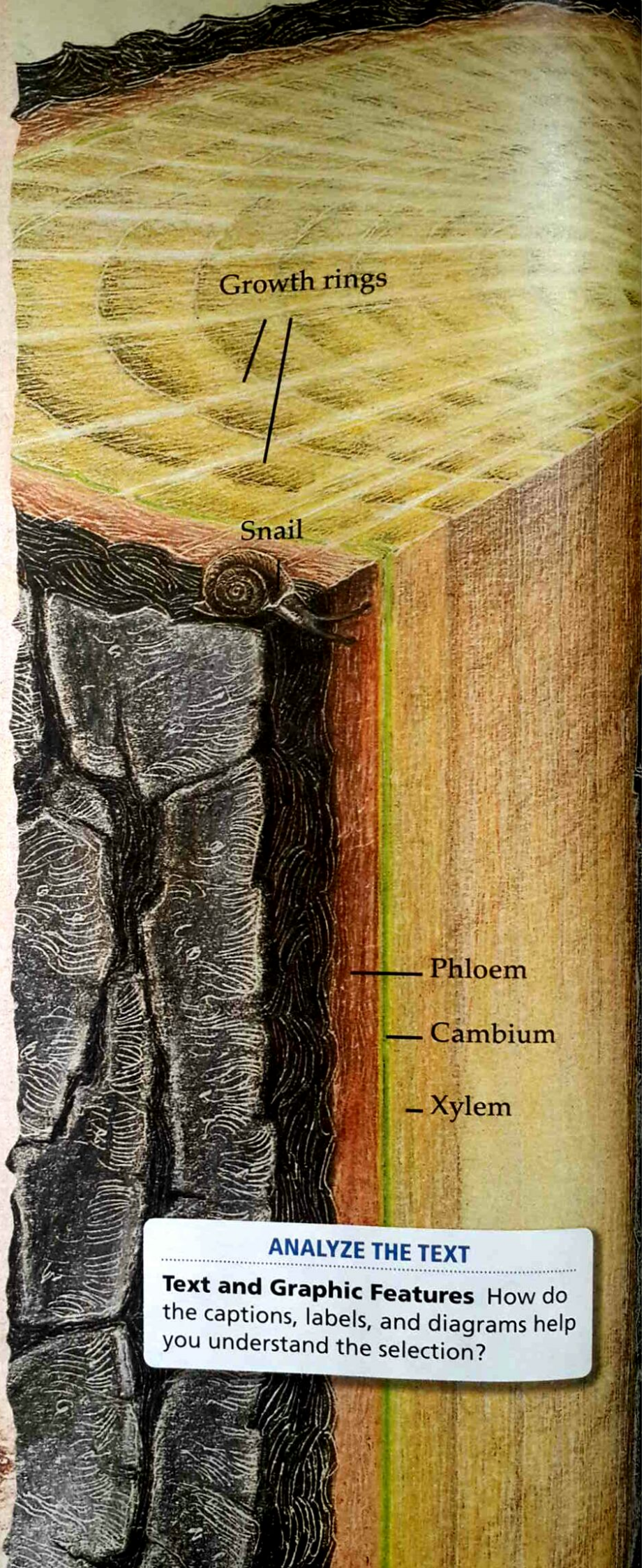
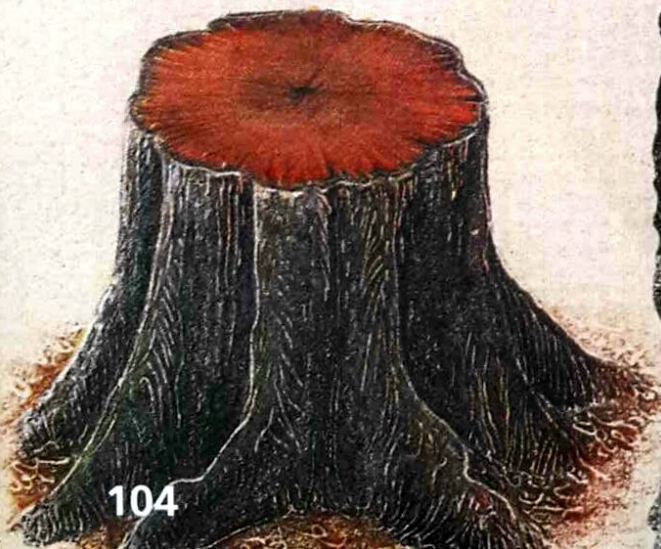


*Honey locust bark
has **spines** to help
protect the tree.*

In cool climates, cambium only grows in spring and summer. Count growth rings to see how old a tree was when it died. An old fir tree can have over a thousand rings, one for each year it lived.

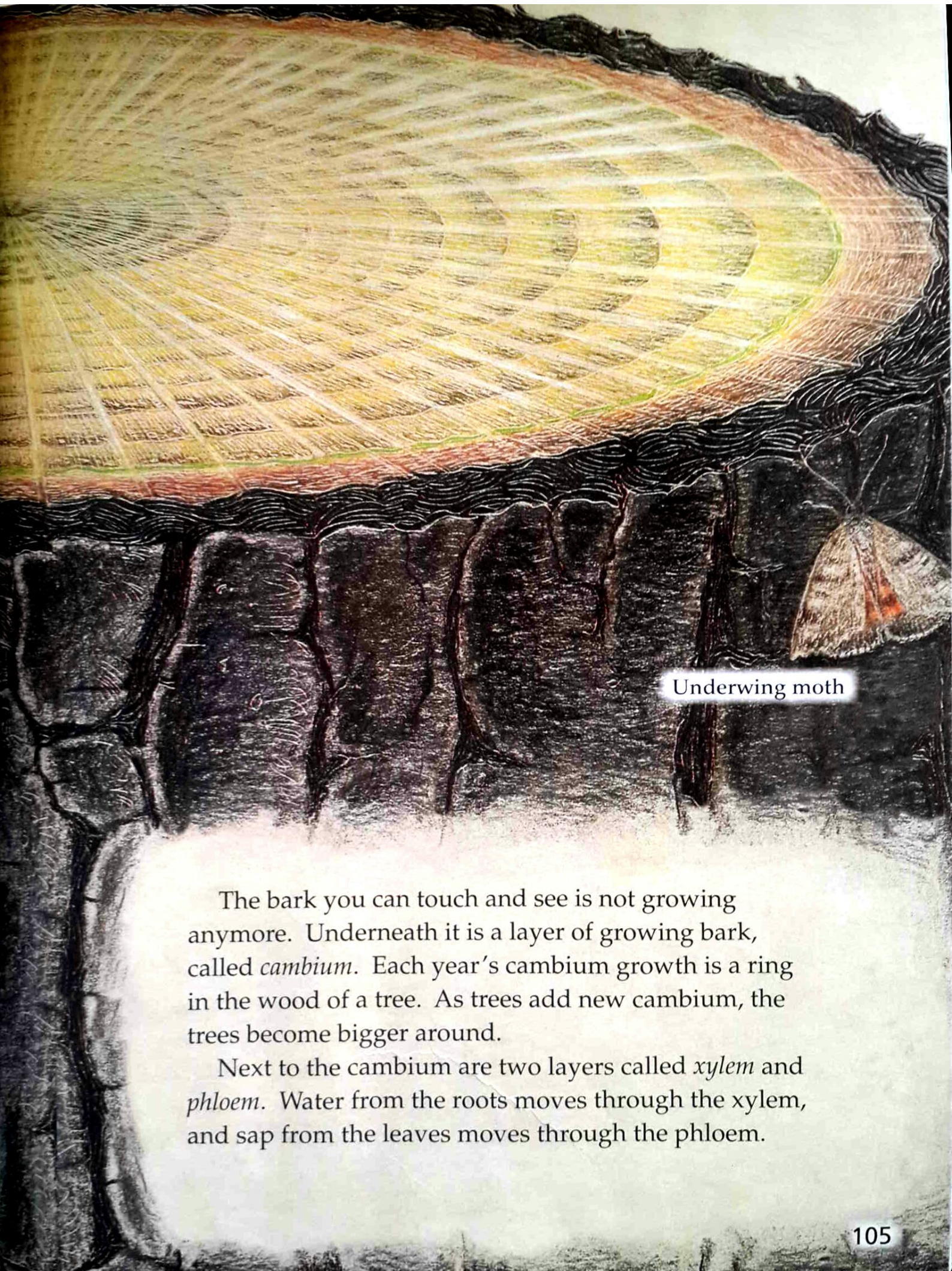


In tropical rain forest trees, the cambium grows all year and there are no rings. It is hard to tell the ages of those trees.



ANALYZE THE TEXT

Text and Graphic Features How do the captions, labels, and diagrams help you understand the selection?



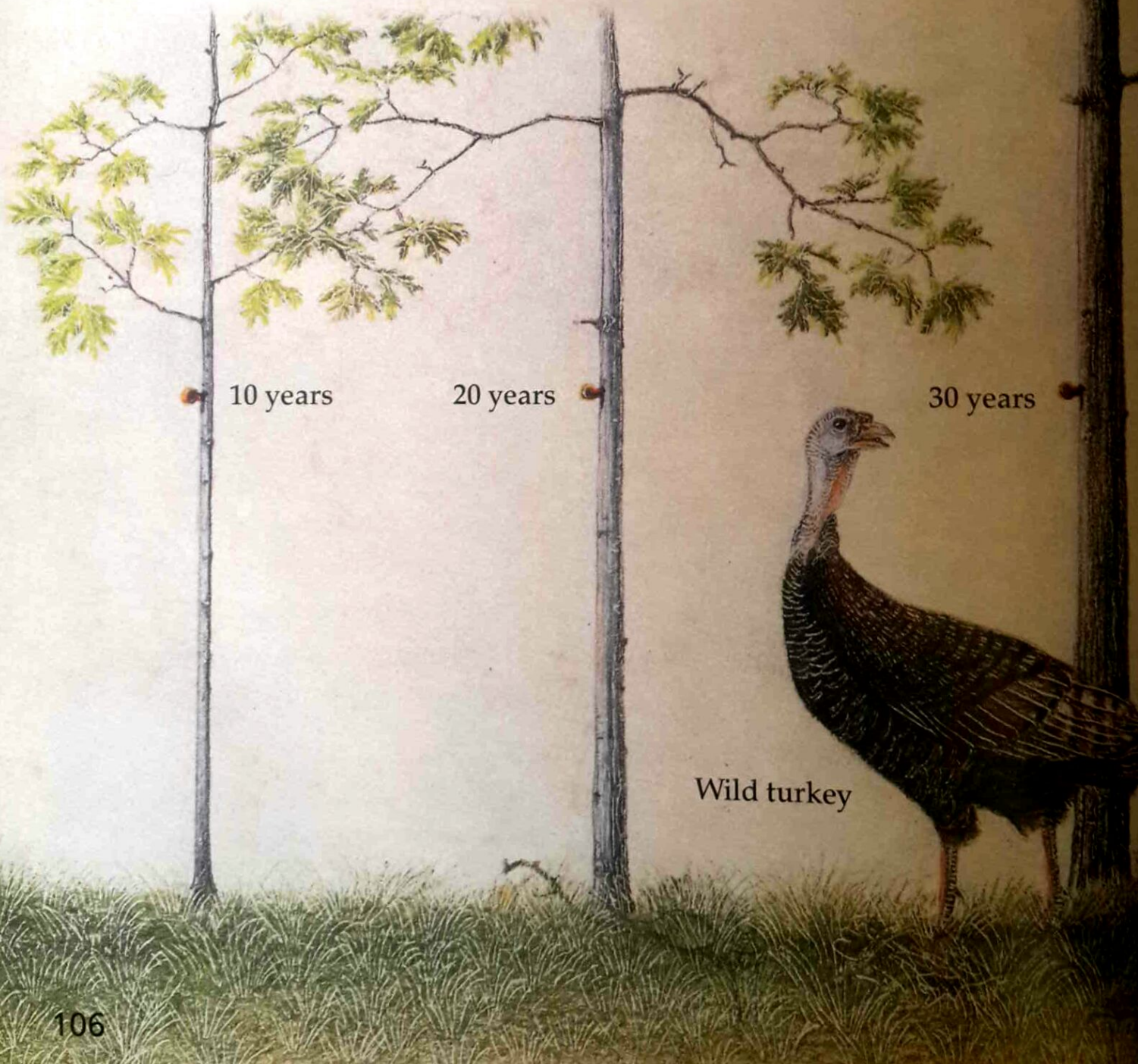
Underwing moth

The bark you can touch and see is not growing anymore. Underneath it is a layer of growing bark, called *cambium*. Each year's cambium growth is a ring in the wood of a tree. As trees add new cambium, the trees become bigger around.

Next to the cambium are two layers called *xylem* and *phloem*. Water from the roots moves through the xylem, and sap from the leaves moves through the phloem.

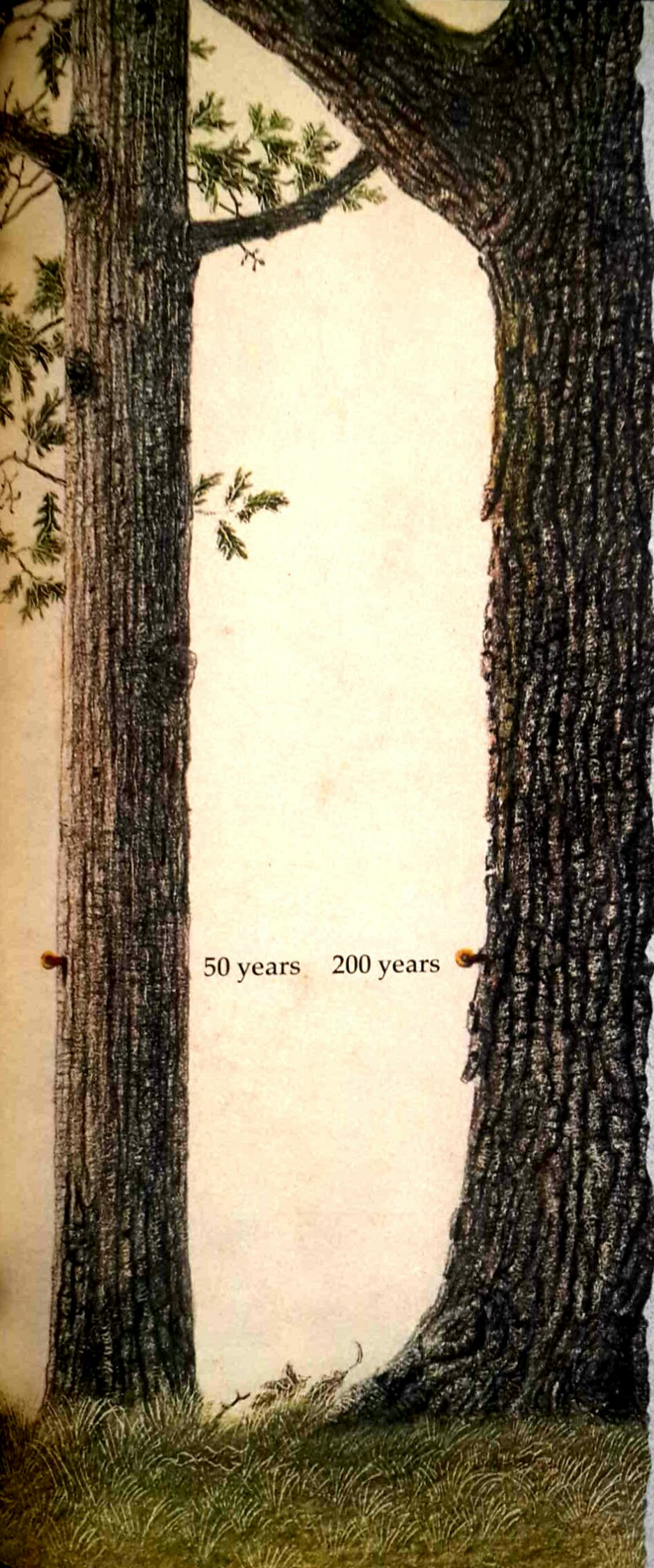
Trees grow bigger around, and they grow taller. As a tree grows, lower branches may fall off, making the trunk look longer. But the branches do not move upward on the trunk. A tree grows taller only at the top, as the tips of the top branches grow upward.

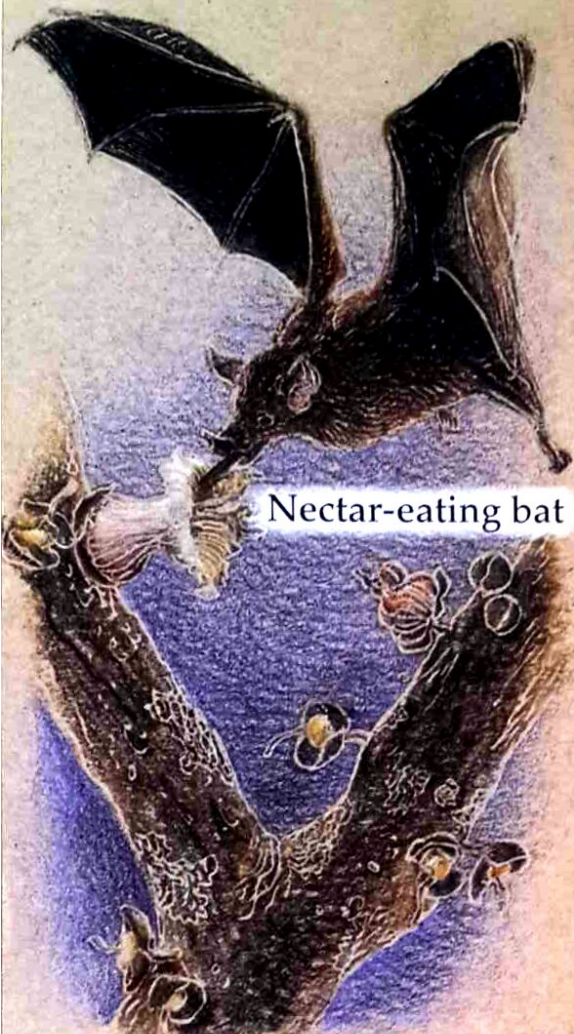
If you find a mark on a tree trunk today, that mark would stay at the same height for as long as the tree lives.



Sequoias are some of the tallest trees in the world—over three hundred feet tall.

50 years 200 years

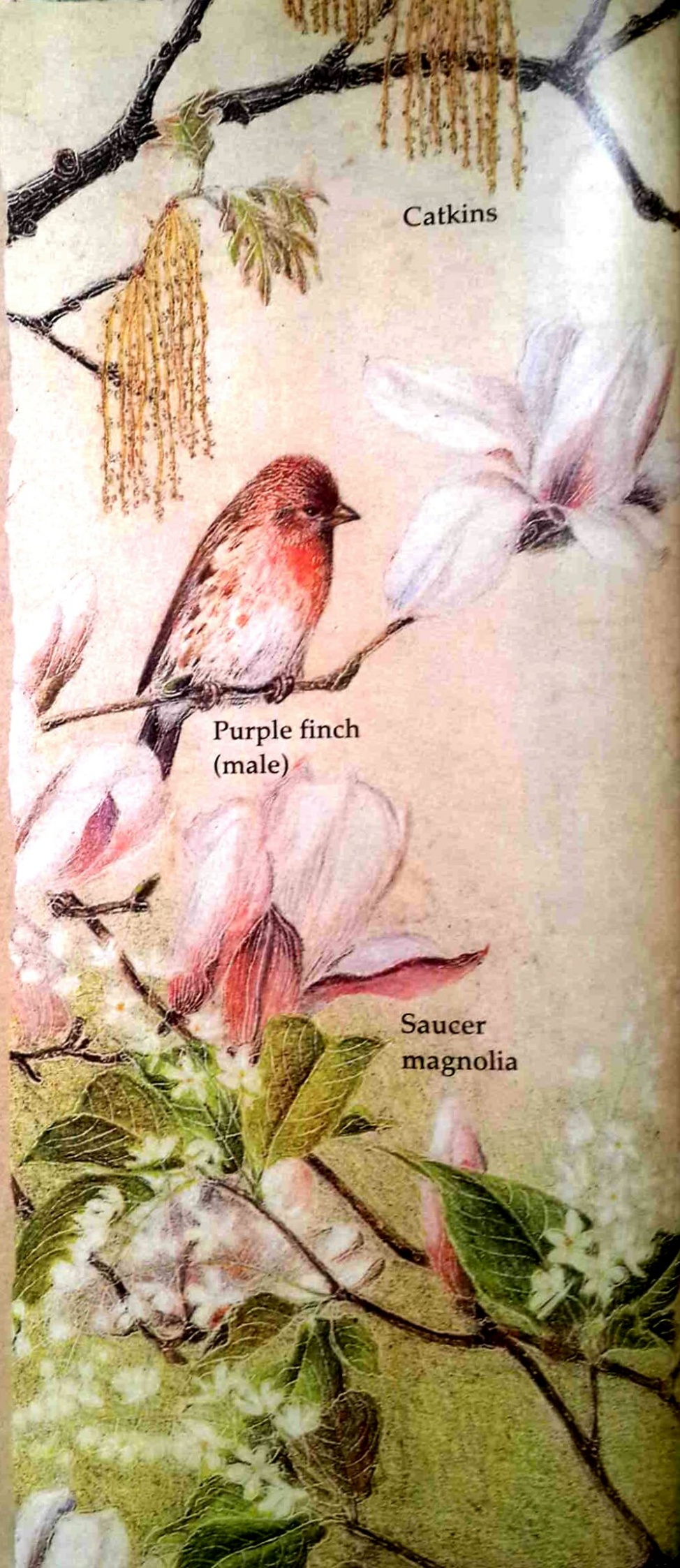




Nectar-eating bat

Calabash tree

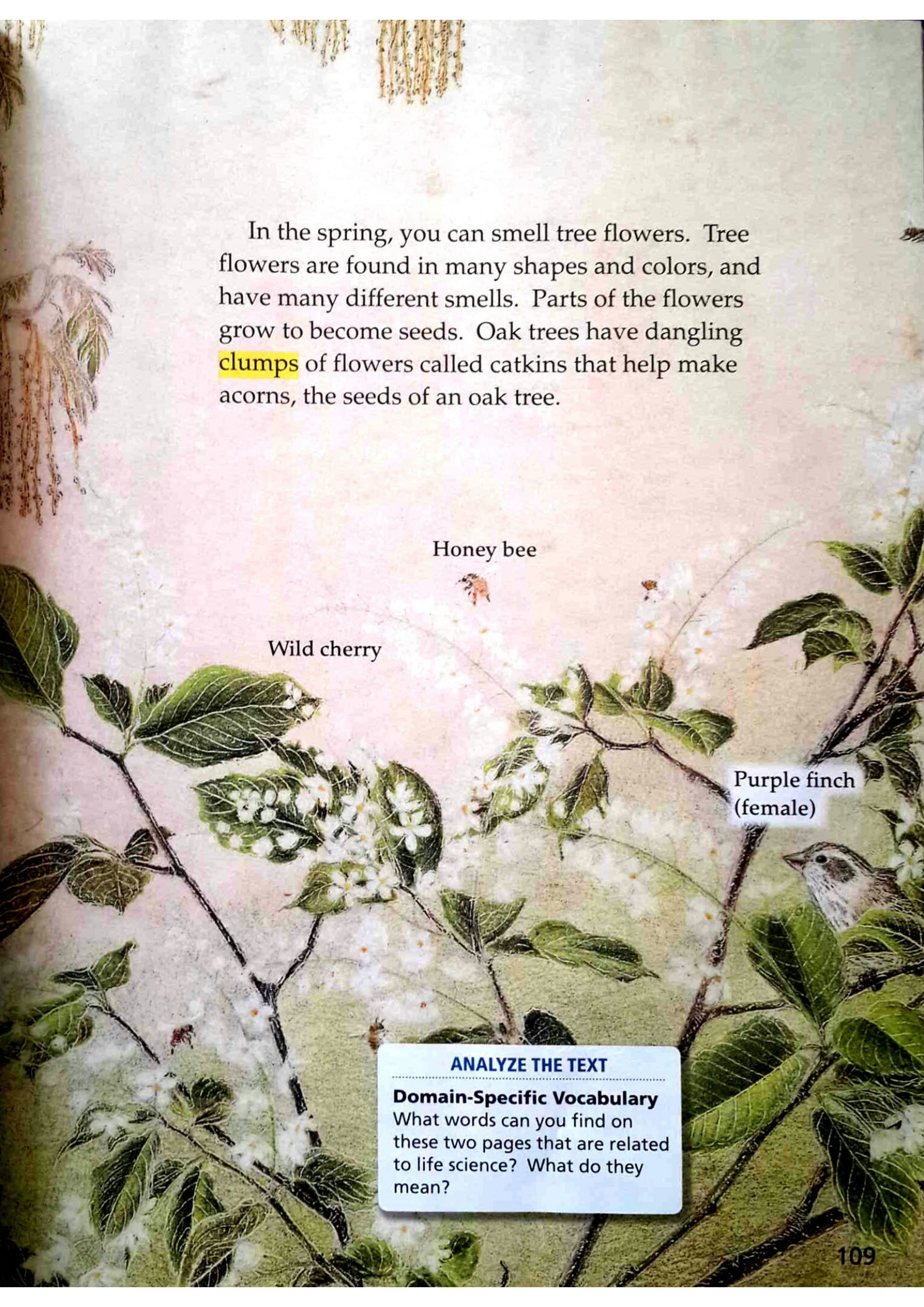
Birds, insects, and even bats are attracted to flowers to drink their sweet juices. When they brush the flowers, the animals get a powder called pollen on them. The animals carry the pollen to other flowers. When the pollen mixes with certain parts of the flowers, seeds grow. Wind also helps pollinate flowers.



Catkins

Purple finch
(male)

Saucer
magnolia



In the spring, you can smell tree flowers. Tree flowers are found in many shapes and colors, and have many different smells. Parts of the flowers grow to become seeds. Oak trees have dangling **clumps** of flowers called catkins that help make acorns, the seeds of an oak tree.

Honey bee

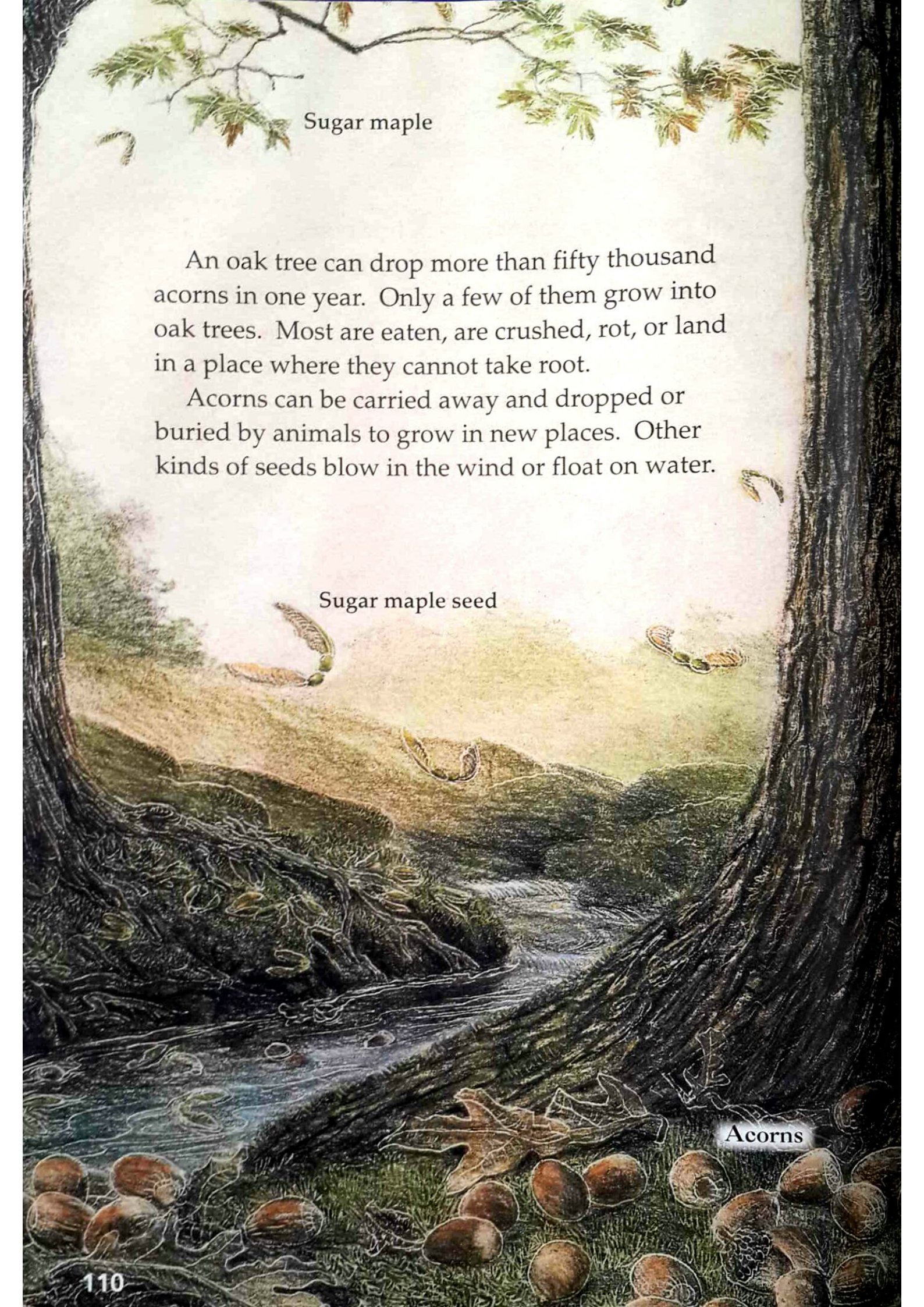
Wild cherry

Purple finch
(female)

ANALYZE THE TEXT

Domain-Specific Vocabulary

What words can you find on these two pages that are related to life science? What do they mean?



Sugar maple

An oak tree can drop more than fifty thousand acorns in one year. Only a few of them grow into oak trees. Most are eaten, are crushed, rot, or land in a place where they cannot take root.

Acorns can be carried away and dropped or buried by animals to grow in new places. Other kinds of seeds blow in the wind or float on water.

Sugar maple seed

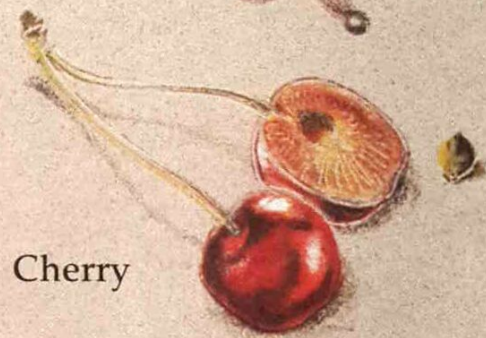
Acorns



Gray squirrel

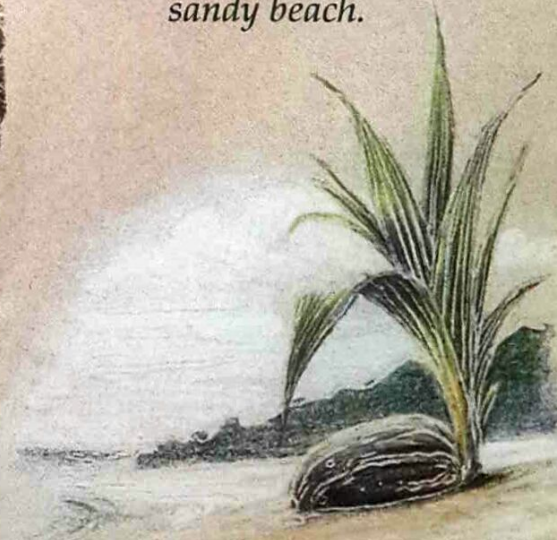
Different kinds of trees make seeds with different coverings. Nuts, cones, and fruits all have seeds inside.

Brazil nut Mountain pine cone



Cherry

Coconuts are seeds of a palm tree. A coconut can float across the ocean and sprout on a sandy beach.



Autumn is a great time to collect leaves. Each tree has its own special color.



Tulip poplar



Ginkgo



Big-tooth aspen



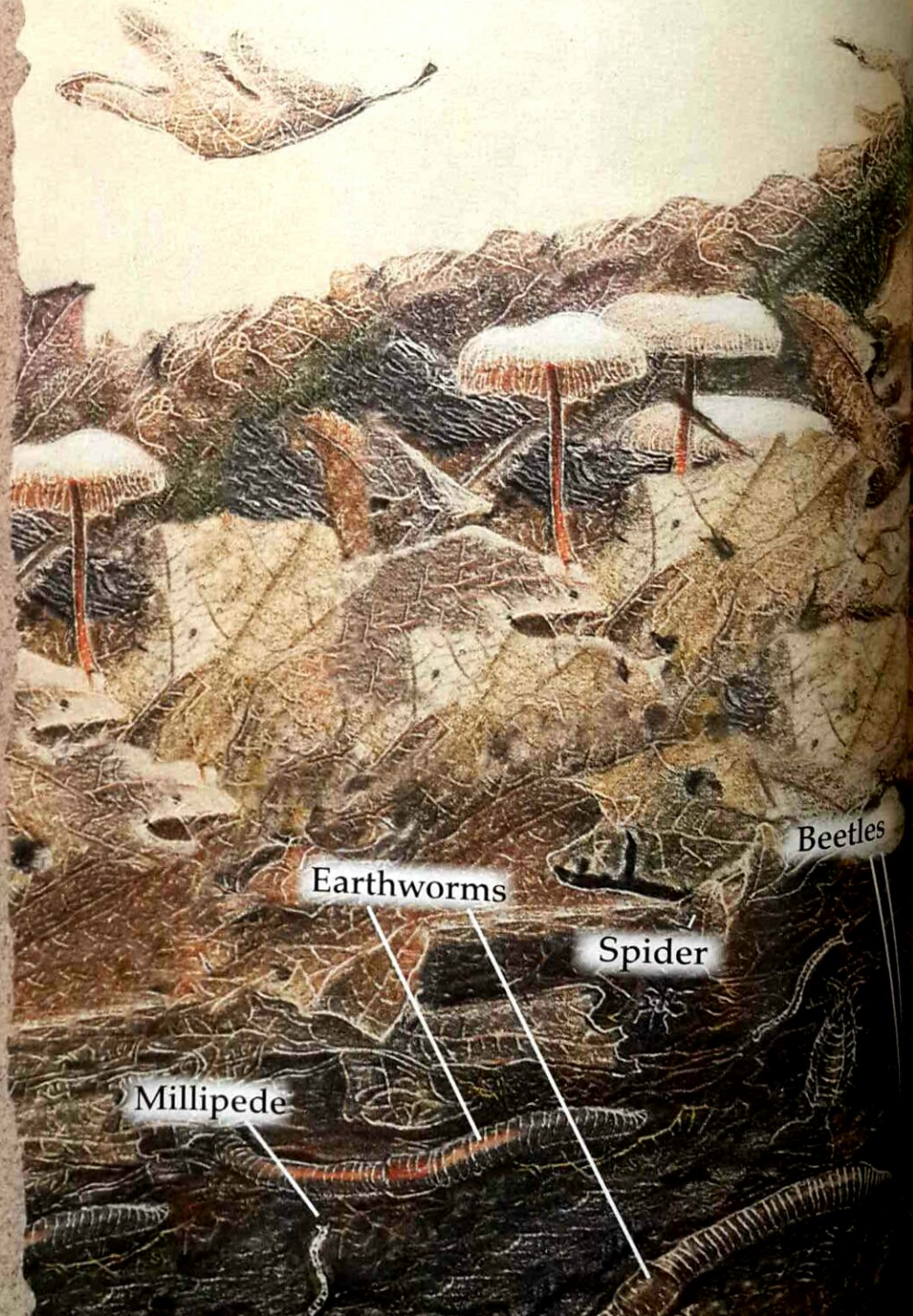
Sweet gum

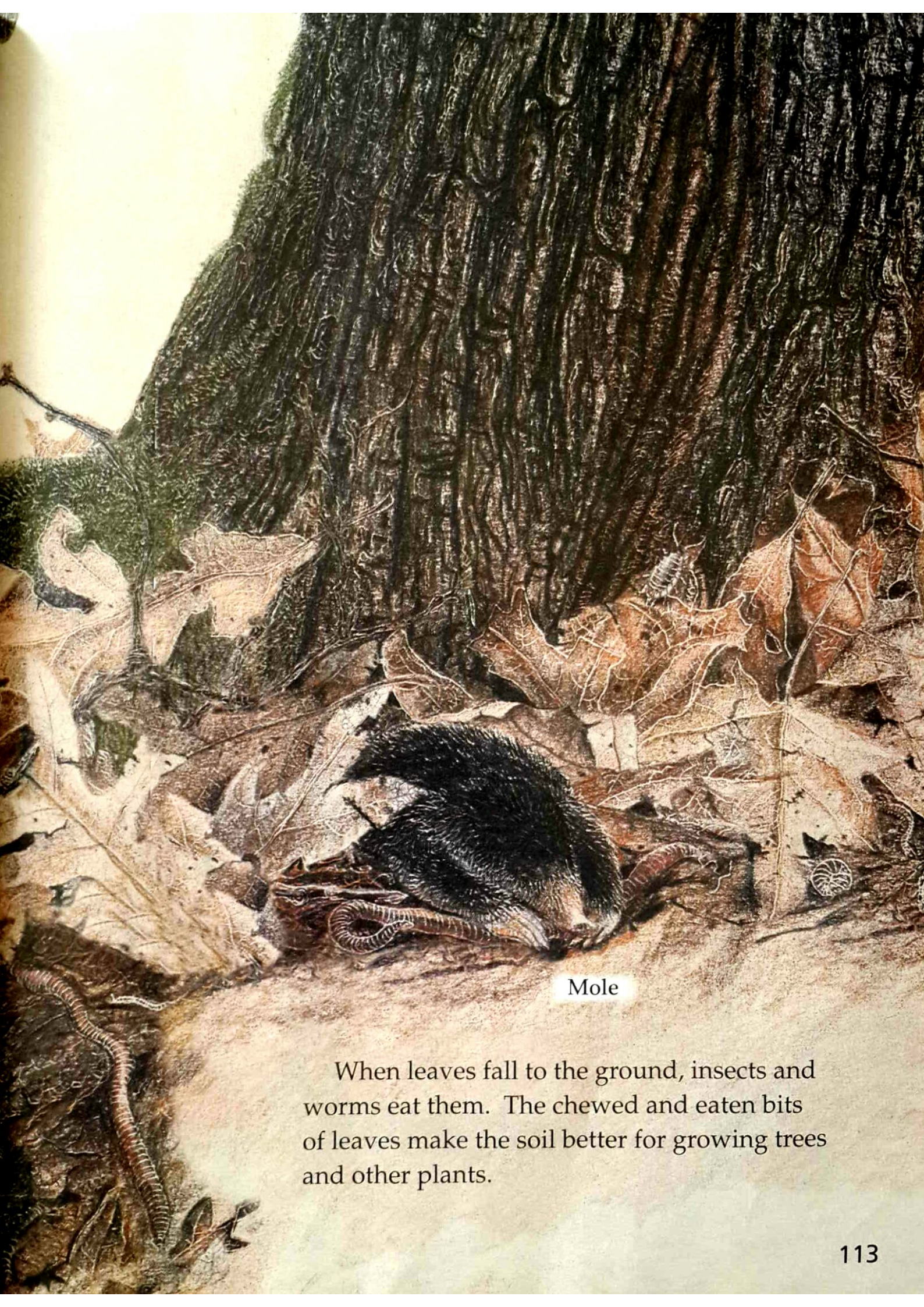


Pin oak

In cool climates, trees stop growing in autumn. The leaves of many trees stop making sugary food for the tree, and they lose their green color. Then you can see the red, brown, yellow, and orange colors that are also in the leaves.

Pine trees and some other trees have needles or leaves that do not change color in autumn.

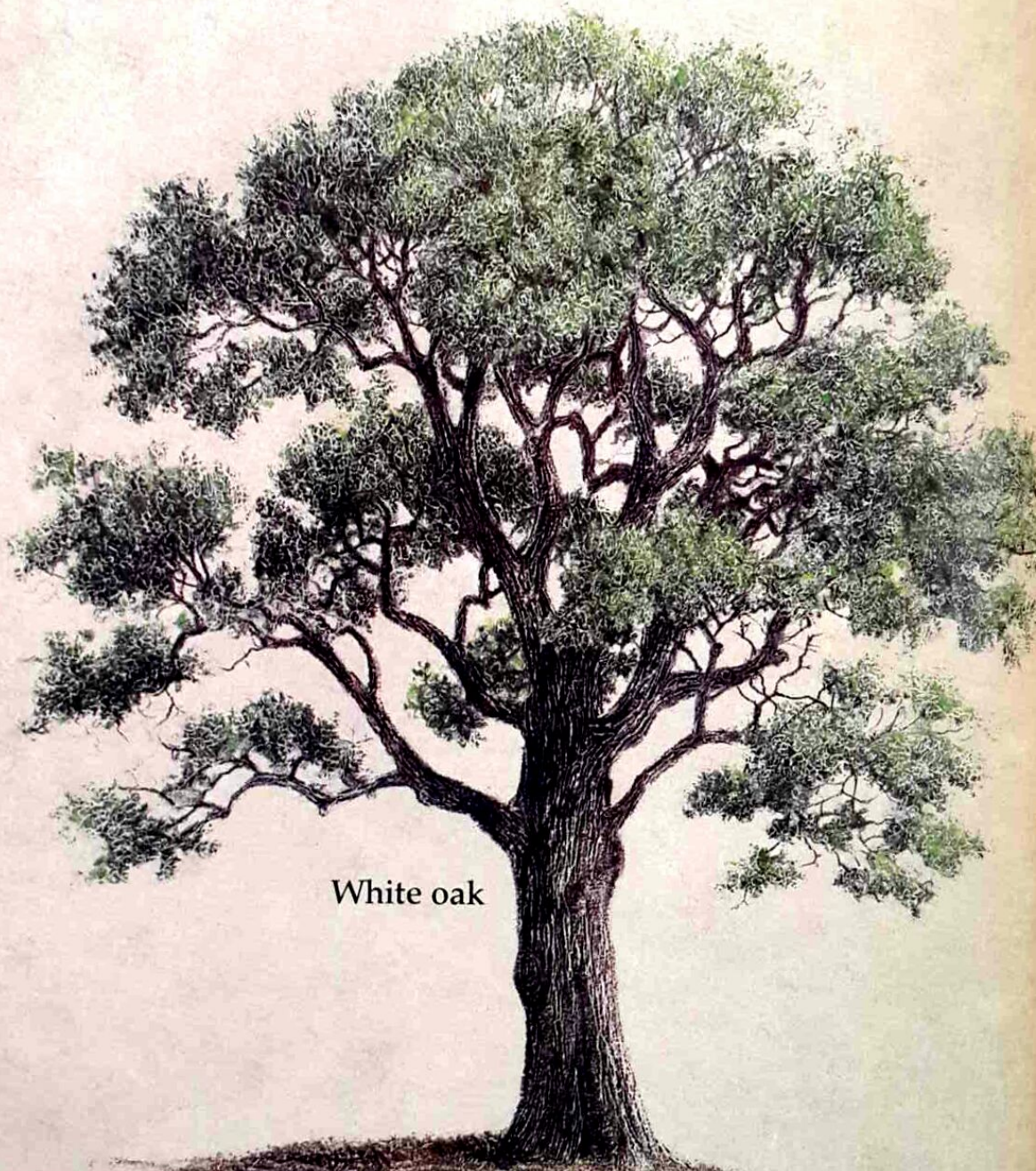




Mole

When leaves fall to the ground, insects and worms eat them. The chewed and eaten bits of leaves make the soil better for growing trees and other plants.

White oak



White oak

Horse chestnut

Trees rest in the cold of winter, and their branches are bare. They may look as if they are dead. But look closely and you can see small buds that will become leaves and flowers in the spring.

In the spring, listen to the wind rustling the leaves. The trees are growing again.