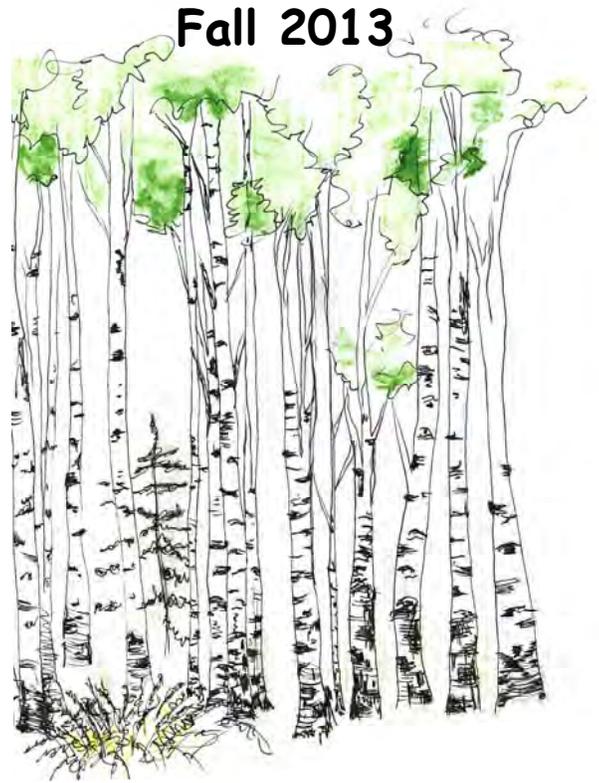


NATURE DETECTIVES

Fall 2013



Awesome Quaking Aspen Trees

How lucky if we get to see a stand of aspen trees in the fall. The leaves shimmy in the breeze, and they shimmer like golden lights against a deep blue autumn sky. Even the sight of a single aspen tree with leaves beginning to blaze yellow-orange brings smiles. But perhaps the most interesting thing about aspens can't even be seen when you look at the trees.

Pull Out and Save

Aspens' truly amazing secret is hidden below ground. Unseen is the fact that some aspens are among the biggest organisms on earth. Bigger than elephants and whales.

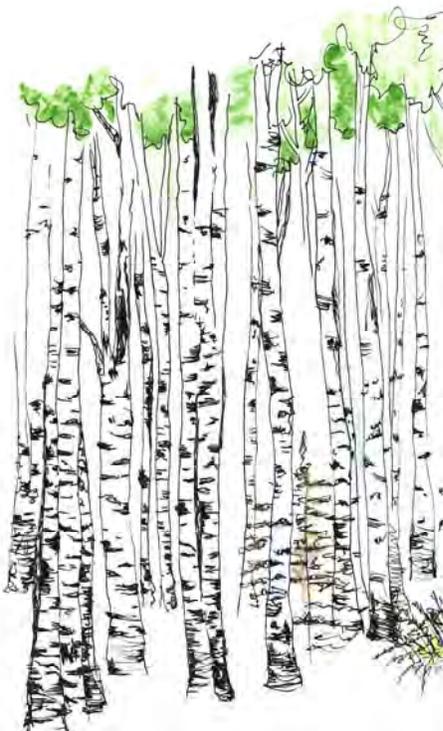
A single aspen plant can actually grow so big it covers several acres in size. And, it might stay alive for thousands of years! But you can't tell it is a giant plant unless you see the roots connected underground. Sometimes you can't see any part of the aspen above ground. For much of its life, an aspen might exist only as living roots.

Roots Galore

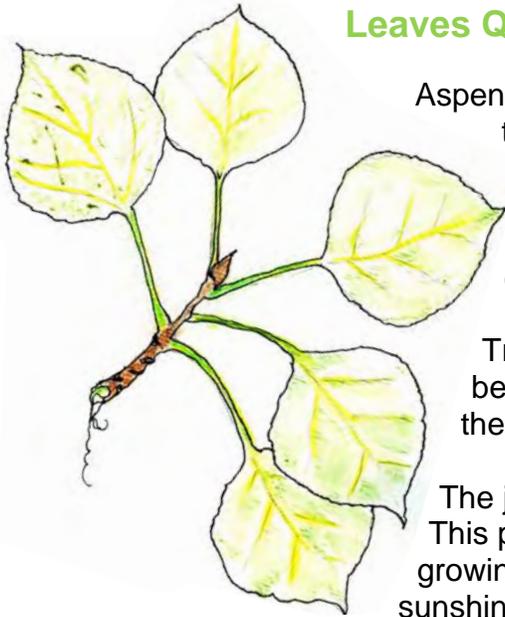
Of course, it is not one tree trunk that grows into a giant. The base of a giant aspen is a huge root system that sends up many sprouts (called **clones**). The roots spread out from a parent tree, and its clones grow into look-alike trees surrounding the parent tree.

Roots first grow down from a single seed and a shoot grows up from the same seed. A healthy shoot continues growing into a tree. Over time the roots grow and grow, spreading farther and farther away from the parent tree. Here and there on the roots, new shoots, the clones, continue to sprout. The clones grow up into thick trunks like the parent tree. Above ground, the clones look like a stand of individual, single trees.

The dirt hides the secret that all those trees are connected with one root system. And when conditions are right it can eventually grow BIG.



Leaves Quake for Sunshine



Aspen leaves quiver because of the way they are attached to the leaf stems. Each round or heart-shaped leaf is very flat and the little leaf stem is flat and sits perpendicular to the leaf. The lightest puff of air will hit either the flat stem or the flat leaf, keeping each leaf in an almost continual flutter.

Trembling allows leaves a little more time in the sunshine because individual leaves are unshaded for split seconds as the leaves above them quake.

The job of the leaves is to use sunlight to produce plant food. This process of making the sugary food that plants need for growing is called photosynthesis. Photosynthesis takes sunshine and water plus carbon dioxide from the air.

Photosynthesis gives off oxygen, which plants don't need, so it is released into the air. We release carbon dioxide into the air when we breathe. You could say the plants are helping us and we are helping the plants.

Aspens thrive in the mountains where the growing season is short. In the montane and subalpine zones, spring warmth comes later than at lower elevations and cool fall air arrives earlier. That means less time for leaves to grow and perform their job. Quaking allows them to get more sunshine during the limited days of summer.

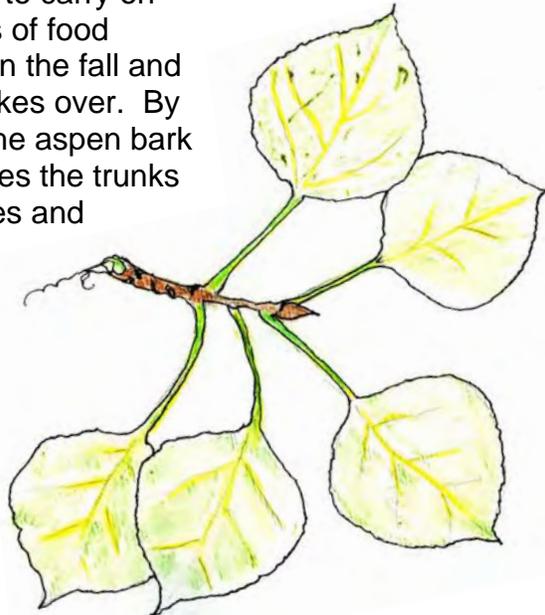
Trunks Have Tricks Too

Perhaps because aspens flourish in the mountains where fall comes soon, aspen trunks have a few tricks of their own as tricky as quaking leaves.

The bark on aspen trunks has the unusual ability to carry on photosynthesis. During the summer, the champs of food making are the leaves, but after the leaves drop in the fall and until new leaves form the next spring, the bark takes over. By providing food for the tree when leaves cannot, the aspen bark helps the trees grow faster. Photosynthesis makes the trunks take on a pale greenish color. Green in the leaves and trunk is from chlorophyll, a necessary chemical part of photosynthesis.

Young aspen trunks feel soft, like velvet. If you rub your hand over the bark, white powder rubs off. The powder is dead cells shed by the bark. Maybe the white powder helps protect the young trunks from the intense high-altitude, winter sun.

Some say the white powder can make an emergency sunscreen for people too.





Bark Scars and Other Animal Signs

As aspen trees grow, lower branches, shaded from above, die and drop off. Where the limbs grew, dark scars develop that have the shape of big human eyes. Other scars of all shapes are evidence of injuries to the tender bark.

Aspens are our only leafy mountain trees that don't need to live near lakes or streams so aspen forests provide important wildlife habitat in other spots. The trees supply food and shelter to critters whose activities leave lots of scars. Scars mark where male elk, deer or moose polish their antlers. Scars form where hungry animals scrape off bark with their teeth or where bears reach high to claw territory warning signs.

Caterpillars eat the leaves, pocket gophers nibble on roots, and elk, deer, moose, bears, porcupines and rabbits eat the nutritious bark. One beaver can eat 20 aspen trees a year. Many birds and squirrels eat the spring buds. Lots of mammals chomp on young sprouts. Aspens are a food source for fungi and bacteria and insects, too.

Birds called sapsuckers hammer holes in the bark to make sap-drip traps for insects. Other birds such as hummingbirds often steal the sapsucker's meal of stuck bugs. Woodpeckers excavate out large cavities for nesting, and those become homes for bluebirds, wrens, nuthatches and chickadees the next nesting season. Other birds build nests among the branches.

Pioneer or Successor

Little wonder that individual clones are short-lived. In a stand of aspen, tree trunks also may be burned to the ground, blown or chopped down or die of disease or old age. Many are lucky to survive 20 years, but the tree continues to send up new little clones as long as the roots are alive and healthy.

Other plants flourish in the filtered sunlight beneath aspens. Baby pine, spruce and fir trees find living conditions ideal in the aspen forest. These conifers will grow tall and some day shade out the aspens. Healthy aspen roots can continue to thrive, protected in the soil, even when it is too shady for its sprouts to survive.

If insects kill the tall conifers, or an avalanche, wildfire or logger cuts them down or a pond dries into a meadow, **it is aspen time again**. Aspen seeds can take root. Maybe up will pop new clones, like new legs or arms, sprouting from aspen roots that had been hiding, waiting for the right moment to reveal their secret existence.



Make Up a Tree Story

Watch an aspen tree and let your imagination go wild. Does your aspen have any eye-shaped scars? Maybe your make-believe story will be about something your aspen saw that scared it so much its leaves began to quake.... Or, maybe your story will be more realistic and you can write about animals that find a home in or near your aspen tree. Write on....

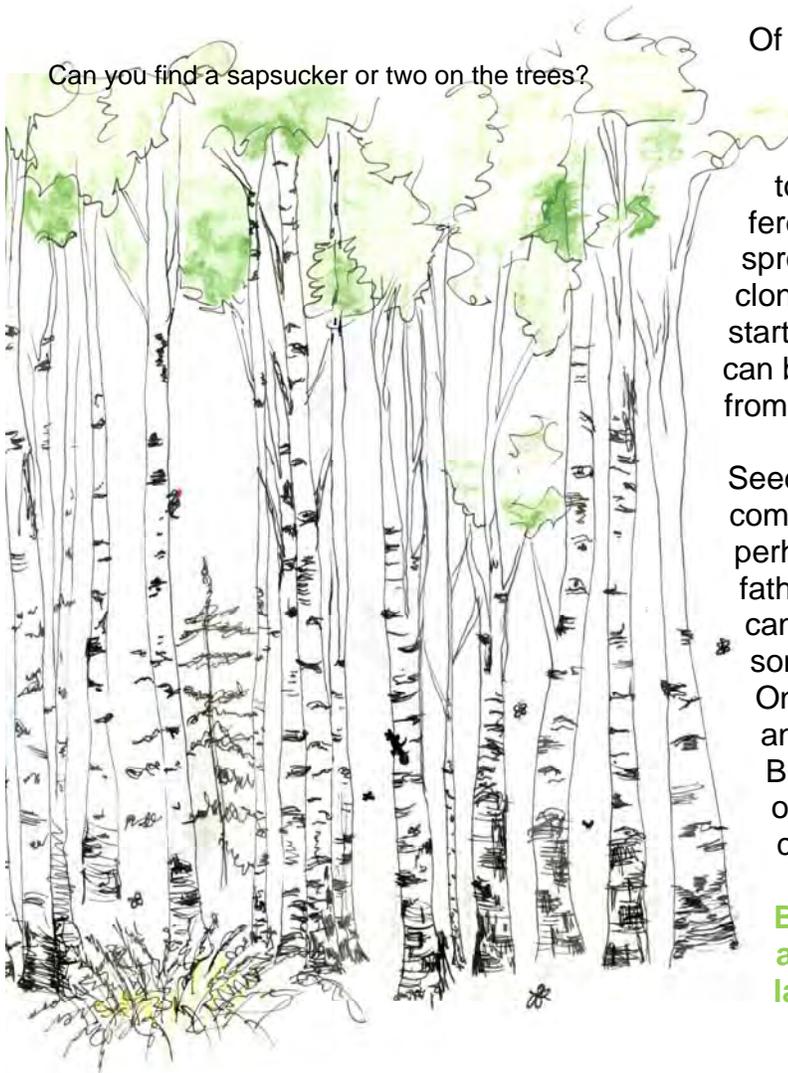
Aspen Tree Nature Detective

Study the scars on the trunk. Any clues to how it was injured? Any tooth marks? Are scars at deer height off the ground? Any holes? Do you think your tree is young or old? What color is the trunk? Does any white powder come off on your hand when you rub it? Do you think your tree is healthy or sick? Any signs of insects? Do you hear any animals around your tree?

Do you think your tree is part of a group of clones? Do the trees look alike? Are the leaves the same? If you study your tree group throughout an entire year, you can watch to see if they all put out their fuzzy, caterpillar-shaped catkins in spring at the same time or if they all leaf out at the same time or turn similar fall colors at the same time or drop their leaves at the same time.



Can you find a sapsucker or two on the trees?



Of course you can't really tell if your trees are clones on one root system even if they appear identical. An aspen patch can have trees mixed together that belong to two or more different root systems. Single trees that sprouted from other seeds can be next to clones, too. Each root system gets its start from a different seed. A fuzzy seed can blow in from a mile away or float down from a nearby aspen tree.

Seeds for your aspen stand might have come from the same mother tree, and perhaps were pollinated by the same father tree. Trees with similar genetics can look very similar, kind of the way some kids in a family can look a lot alike. Only a scientist who does genetic analysis can tell for sure. But if a tree looks different from the others, you can be pretty sure it is not a clone of the others.

Bicycle the Meyers Homestead Trail at Walker Ranch to check out the large aspen grove there.