

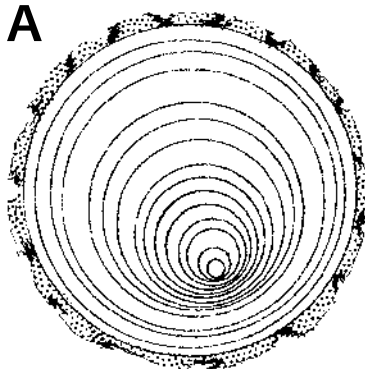
## APPENDIX THREE READING STORIES IN TREE RINGS

Each year, trees that grow in temperate regions (nontropical) create a layer of wood around the circumference of the trunk and branches. Rapid growth during springtime creates many xylem cells, which make a light-colored wood known as **spring wood**. As tree growth slows during the hot, dry summer, new xylem cells are laid more tightly and produce a darker circle of wood. This is often called **summer wood**. One layer of light-colored spring wood along with one layer of darker summer wood marks the passage of a year in the tree's life. Reading tree rings can give us clues as to former growing conditions, droughts, insect infestations, or fire.

Trained foresters who are familiar with the trees they work with can estimate a tree's age from its appearance. For the rest of us, the only way to know a tree's age is to get a cross section of the trunk. (Or you can ask a forester for a core sample, which gives you the same information without killing the tree.)

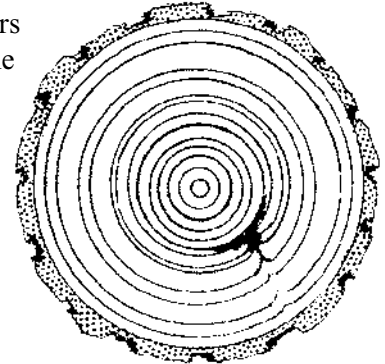
Generally, wide rings indicate years of vigorous growth, and may represent a season of abundant water, sunlight, nutrients, and space. Often, the rings laid on when the tree is a sapling are wider than growth in later years. Narrower rings indicate years of slower growth, and may represent a season of inadequate water, sunlight, nutrients, or space. Sunlight may change from one season to the next due to competition and shading from other trees, topography, or structures.

Sometimes you may notice a ring with wider growth on one side and narrower growth on the other (A). Competition from other nearby trees can cause this condition. Sometimes uneven growth rings result when one tree falls and leans against another live tree and the live tree grows more on one side to curve up around the fallen tree. Other explanations may include a tree growing on a slope or on slumping ground, or a windstorm may have

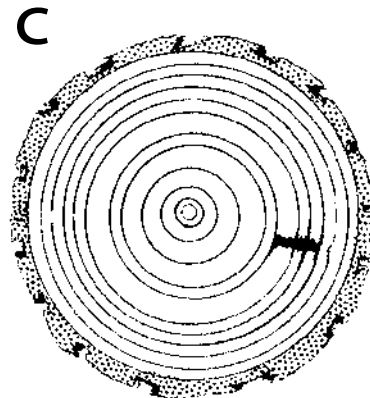


pushed the tree to lean to one side. When that happens, the tree lays on thicker growth on the side closest to the ground in an effort to grow upright again.

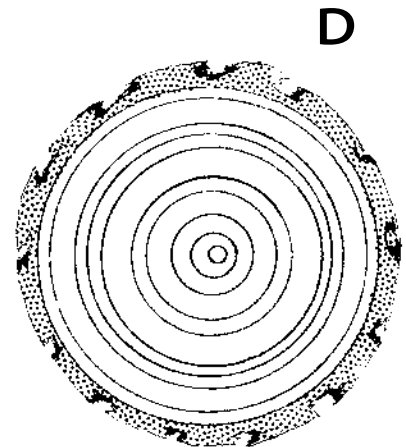
Trees record injuries in the form of scars (B). Scars on tree rings may come from fire, insects, or damage from machines like lawn mowers, earthmovers, or vehicles.



The mark beginning in year six (in C) is all that's left of a branch that died and fell off. Eventually, the tree's trunk grew around the remains of the branch and covered it.



Narrow and wide rings on the same tree (D) could have been caused by intermittent years of drought, insect damage, construction damage, or other disturbance. If a tree loses all or most of its leaves because of an insect attack or drought, it is not able to make food and grows very little that year. Root damage from the construction of a house or sidewalk too close to the tree reduces the water and minerals the roots can absorb.



Sometimes, people cut cross-section disks from the trunk of a tree or branch and then sand and varnish them to make the rings more visible. A sample cross section is often called a “tree cookie.”

### ***Are Big Trees Older Than Smaller Trees?***

Just because a tree is large, don't assume that tree is older than a small tree. For example, a 50-year-old cottonwood can grow as tall as 100 feet and grow more than 300 inches in circumference, while a red maple tree of the same age could rarely match the cottonwood in circumference and height.

Studying tree rings is called *dendrochronology*. When foresters notice the outside rings of a tree beginning to narrow, this could be a sign that the tree's neighbors may be crowding it out.



Time to thin this forest. Notice the trees' rings are narrowing toward the outer edges.



Heart rot in American basswood.



Fire scar.

Photos courtesy of Eli Sagor