A Portion of "Trees That Twist"

by Enos A. Mills

During years of wandering through the forest I found twisted trees of many kinds and in many places, and I frequently asked myself, why do trees twist? The twisted grain of trees proved to be an interesting study in tree physiology.

One day I watched a bear start to cross a swift mountain stream on a slender, fallen tree that made a forty-foot bridge. The water was high, and it roared and surged as it entered the mouth of a deep canyon. The rocky banks rose twelve or fifteen feet above the water. Without the least hesitation the bear stepped upon the log and started to walk across. The log at once began to sag beneath his weight. Bears are good swimmers and I expected after two or three steps the log would break and I would see him in the swift current. But he only turned his head to watch the sticks that were floating swiftly along beneath him. As he approached the center of the log he struck playfully at one of the passing objects, although his paw did not reach within four feet of it. He caused the sagging log to bob up and down, and plainly enjoyed this movement. Without any mishap the bear proceeded across the log, lingered a moment on the opposite bank to listen to the roar of the water, and then went on up the mountainside. I wondered if he had ever crossed this log before and knew how tough it was. I went over to examine it.

This log was wet and toughened from a rain of the preceding night. But without any wetting it would have been a tough one. It proved to be a Douglas spruce, a tree whose wood is most sought for airplane timber, and which has for a century furnished the ship masts on the seven seas of the world. In places the bark was torn off, and as

I examined it I discovered that the fibers of the wood were twisted round and round like the turns of a screw. I chopped deep into the tree and found that it was twisted nearly to the center. Then I walked across and cutting off the top of the tree and found there it was twisted through to the center. Returning to the other side of the stream I chopped off the stump with its upturned roots and found that the twist at the bottom had begun when the tree was about two inches in diameter. This spruce had grown close to the bank of the stream with its roots wedged in the vertical and horizontal cracks of the rocks.

In questioning numbers of people about twisted trees I was told that the wind was the chief cause of this deviation from the normally straight grain. This seemed plausible, but after finding pronounced twists in trees in sheltered coves and in the bottom of windless canyons, I abandoned the wind as even a possible factor.

Several lumbermen told me that soft woods such as pines, firs and aspens twist from left to right, and the hard woods from right to left. And I was also repeatedly told that trees in the northern hemisphere twist only from left to right and that below the equator they twist from right to left. This I believed until one day I found contradictory evidence. I had photographed a dead pine of pronounced spiral growth, twisting from left to right. In developing the negative I discovered another pine standing a few feet from the twisted tree that had a twist in the reverse direction.

Limber pine and Douglas spruce are the two species, of the trees I have examined, which show the most extreme twists. I have also found specimens of twisted trees among the western yellow pine, the lodgepole pine, the aspen, elm, cottonwood and two or three species of oak. It may be that all species twist, though less intensely, whenever there is an influential combination of resistant conditions.

One day I examined a dead pine in which the turns of the spiral were so close

together that the log had the appearance of being wrapped round and round horizontally with a grayish-brown yarn of wood fibre. But in most trees the twist is more nearly that of a much elongated spiral spring, going around a tree of one foot diameter once in every two feet of rise. The spiral paint on a stick of candy illustrates the closeness of the turns in the twist of most twisted trees. The limbs of twisted trees appear to be twisted in the same direction and in like degree as the trunk.

It is almost an impossibility to split these larger twisted trees. Limbs or knots run through the coiled spirals like so many iron bolts or reinforcing rods of steel. I have tried splitting short twisted sticks when they were wet. I had exercise but did not add to the pile of split wood. When they are frozen, however, they can be split.

Trees of this twisted type are more durable for outside timbers; and when sawed they often are more attractive for veneer or for polish than the woods of more straight grained trees.

The most closely twisted trees that I have seen are the limber pine of the Rocky Mountains from an altitude of 8,000 feet to Timberline, somewhat above 11,000 feet. And the most intensely twisted specimens of these were trees that grew in the most trying conditions at timberline—contending with high winds, drouths, sudden changes of temperature and an excess of rocks in the soil.

The twist in a living tree rarely shows unless the bark has been removed from some cause. I have had the best opportunities to study twisted trees in fire-killed areas where the bark has been burned off, and at timberline and other windswept places where the bark has been sandblasted away, and in trees struck by lightning where the lightning has torn its spiral pathway in the bark.

Even lightning is given a spiral journey by the structure of a twisted tree. When lightning strikes a tree of ordinary straight grain it usually runs directly to earth,

plowing a furrow, bark-deep, along the way. But when a twisted tree is struck the bolt generally follows the spiral fibres round and round the trunk to the ground. This course is evidently the line of least resistance. I have found a few of these twisted trees which were completely wrecked at the base by the lightning bolt. On entering the roots the electricity appears to have exploded, tearing the base to pieces and hurling roots and rocks in every direction. But the majority of lightning-struck trees, as well as straight-grained trees, are not seriously injured by the bolt.