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### Rolling the Cambium and Damage Response.

Some techniques in bonsai are quite complex, but some of the most effective are the most simple. Getting the cambium to roll over is a basic technique to cover scars and large cuts and can turn an average bonsai into a masterpiece. What's more, it does not involve major rocket science.

The cambium is the green, actively growing layer between the bark and heartwood of a tree or plant. Apart from the new leaves and shoots on the perimeter of the plant, the cambium is the only growing area of a tree, and is the part of the tree that most of our efforts of manipulation are directed at. The heartwood is primarily dead cambium and the bark of most trees is either dead or dormant and is really just a protective layer. Phloem (pronounced Flo – Em), the vessels that carry the sap, are present in the cambium, and as the trunk or branches grow in width the cambium is renewed just under the bark, and the bark cracks and spreads.

If the cambium is “damaged” in some way, it reacts by producing more “growth” in that area, and the astute bonsai artist can use this damage response to good effect.

My little fig is once again the subject of this demonstration. The more observant of you will notice that it has lost a side branch since it last appeared in this magazine about three months ago. Here's a quick tip, when bending a branch that has been wired, apply pressure to the wire and not the branch itself.

Back to the cambium, I am using the damage response technique to slowly close the hobbit hole at the back. In about four years I have closed the hole by more than half its original size. I gently scrape the thin outer bark off all the way around the scar just on the rim where I want more plant material to develop. I use a penknife for this job, but any rigid blade will do just as well. Scrape just very slightly into the green layer, and try and be as neat as possible. In responding to the damage the tree will grow more vigorously in that area and produce more plant material there than what was removed. I repeat the process every few months in the growing season. In four or five years time it will be completely closed and hopefully with a new side branch the tree will once again be a magnificent bonsai.

The damage response technique can be used in a variety of ways. Tapping the base of a tree all the way around the trunk with a rubber mallet can stimulate the cambium and the added growth can thicken the trunk quite quickly. The process of bending a branch that has wire wrapped around it will separate the cambium from the heartwood in some places leaving slight gaps. The cambium will then thicken to take up that space, and in fact the cambium throughout the reshaped branch will be stimulated to grow and as a result more buds will form and the plant will become healthier. The length of time that it takes for the cambium to renew itself is the length of time the wire should remain on the branch. Often an extreme bend in a branch will take less time to set than subtle changes of direction simply because the damage response mechanism has been stimulated more.

I have used the word “damage” with slight misgivings because some people might misinterpret it as being something harmful to the plant, and that it suffers during this process. This is not true. All we are doing is providing similar stimulation to the plant that it would get from natural events, an animal rubbing against a trunk, excessive wind (not medical but metrological) or even insect activity, it is just that we are doing it with some measure of control with a game plan.