

Tree structure

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Tree Structure

A photograph of a large, leafy tree in a residential or commercial setting. The tree's trunk is thick and dark, and its branches are dense with green leaves. One prominent branch on the right side of the tree is broken and hangs down, indicating a structural issue. In the background, there is a building with a tiled roof and a paved area with a car. The overall scene is outdoors with bright lighting.

What's the Problem?

What is good structure?

Outline of topics

1. Forest grown vs. open grown tree
2. Codominant stems
3. Good branch attachment
4. Structurally sound tree

1. Forest grown tree

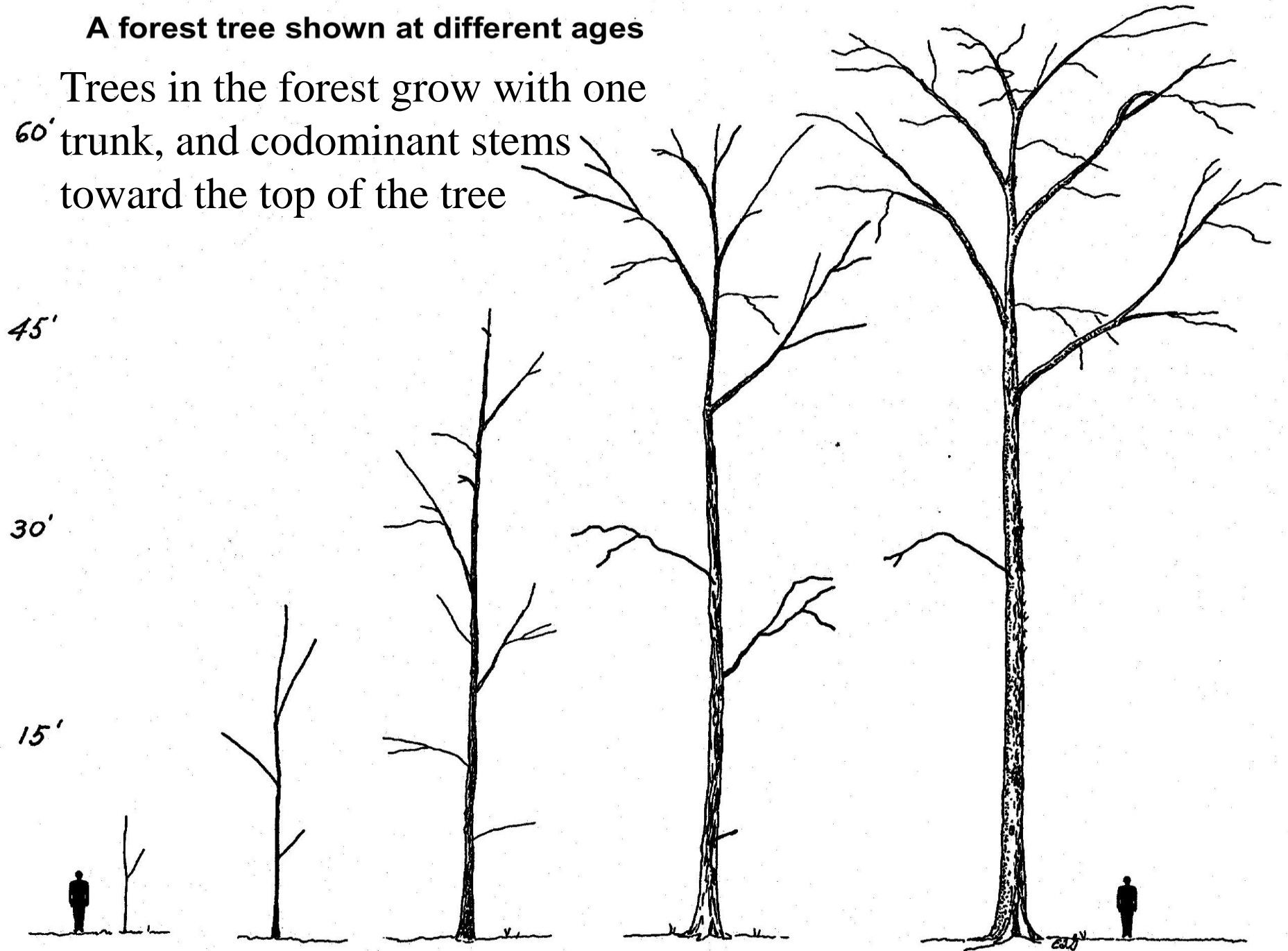
vs..

Open grown tree

- How do they develop on their own?

A forest tree shown at different ages

Trees in the forest grow with one
60' trunk, and codominant stems
toward the top of the tree





Codominant stems form far up into the canopy on most forest trees

Open grown trees

- Canopy develops low on the trunk
- Canopy spreads wide
- Tree is often wider than tall

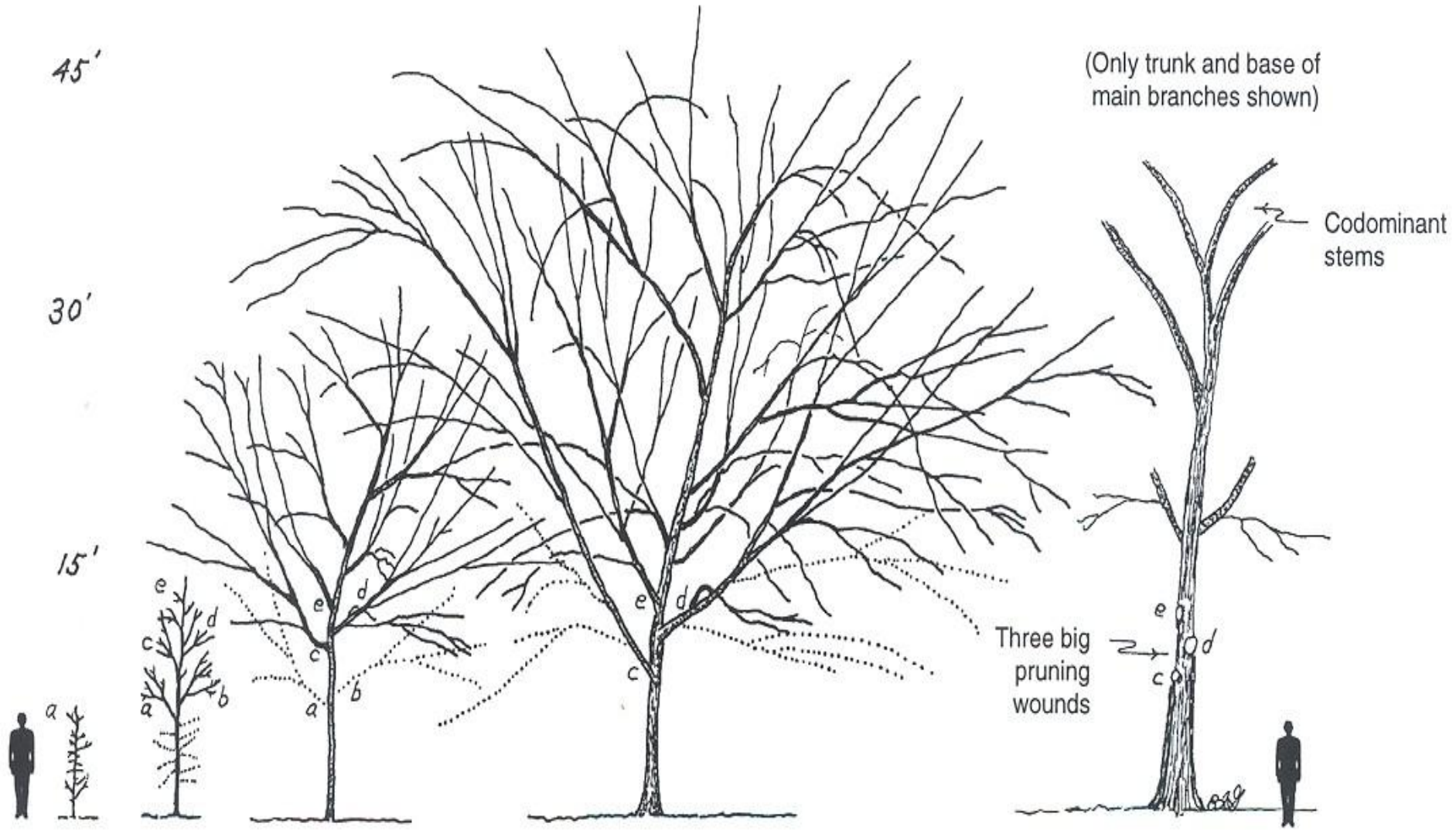




Its party
time for all

Its all about access
to sunlight

A landscape tree shown at different ages



Nursery liner

Finished nursery tree

Young landscape tree

Medium-aged landscape tree

Medium-aged landscape tree a few years later

Appears to be a nice tree





Close-up of base
of tree





Huge
crack



Same tree five
years later



“Fall down go boom tree”

Keep an eye on this side of the tree





“I thought I heard something
creak last night”

What is good structure?

Outline of topics

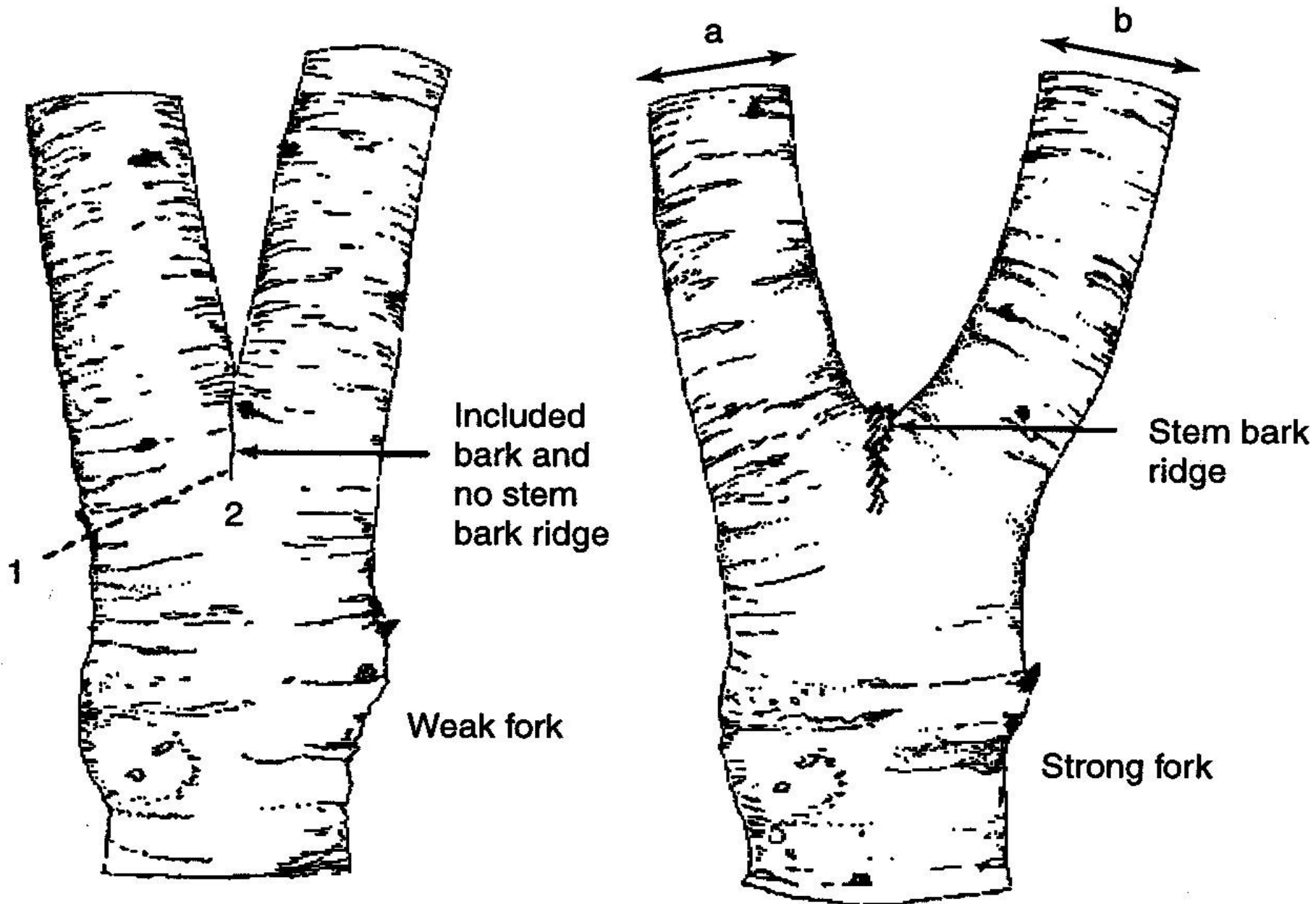
1. Forest grown vs. open grown tree
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2. Codominant stems

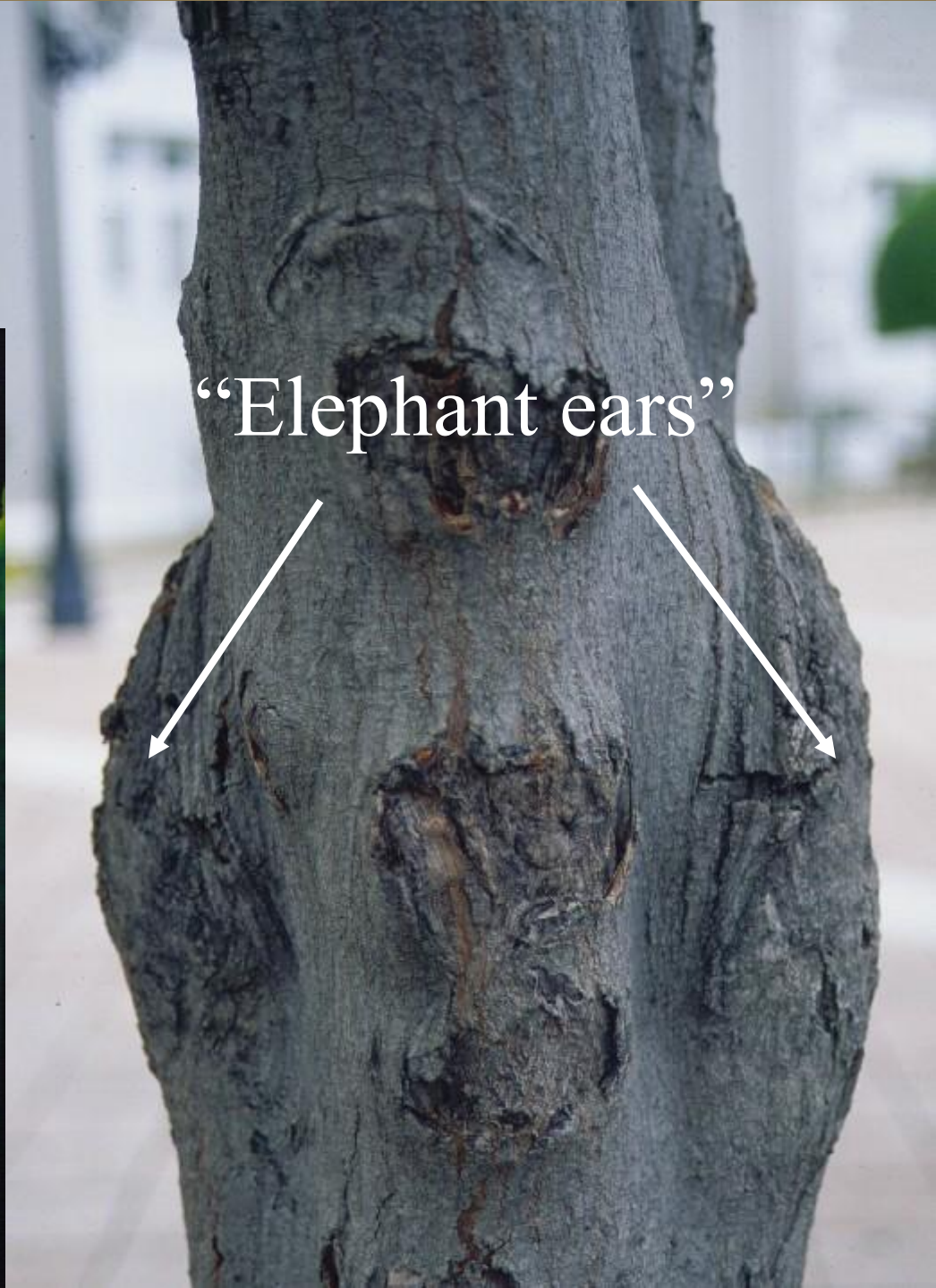
Stems nearly same diameter



Two codominant stems



These are weak



Why are they
a problem?

Included bark
beginning to form



A close-up photograph of a tree trunk. The bark is dark grey and textured. A vertical crack runs down the center of the trunk. At the bottom, there is a large, irregular wound where the bark has been removed, revealing the underlying wood. The wood shows signs of decay, with a darker, more discolored area. The text 'Bark inclusion' is overlaid in white, serif font in the upper middle. The text 'Decay and discoloration from self wounding' is overlaid in white, serif font in the lower right, with a white arrow pointing to the decayed wood.

Bark inclusion

Decay and
discoloration
from self
wounding

Bark
inclusion

Closed
crack
indicating
inclusion

Near-normal
wood formation





Bark inclusion

Closure
crack
indicating
inclusion

Bark inclusion
(Not a codominant stem!)



Close-up of closure crack



What is good structure?

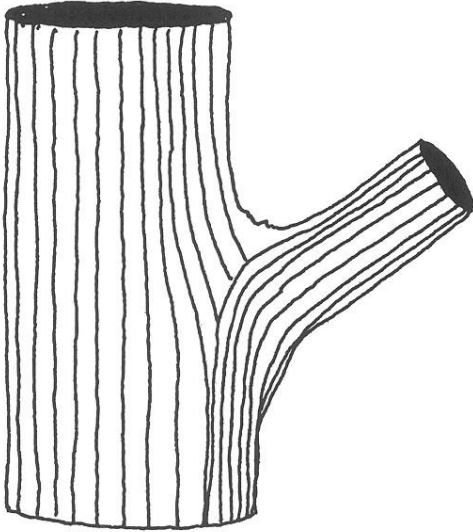
Outline of topics

1. Forest grown vs. open grown tree
2. Codominant stems
3. **Good branch attachment**
4. Structurally sound tree

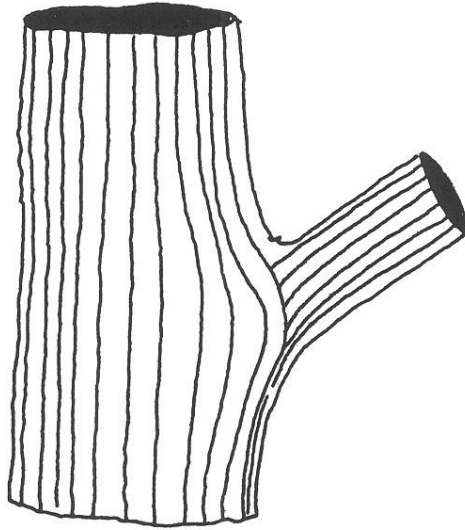
3. Good branch attachment

- How does a BRANCH form?
- What are the indicators?

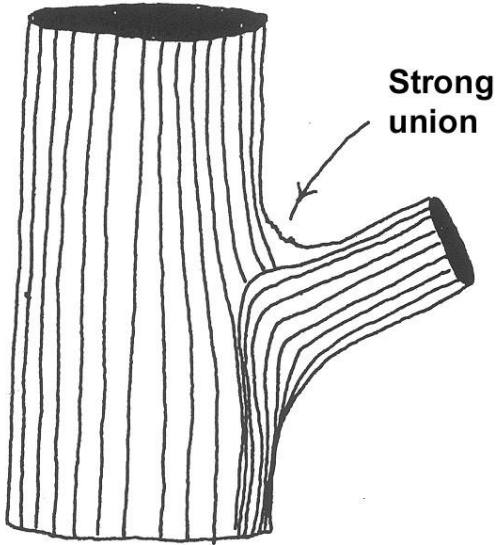
Early last year



Later last year

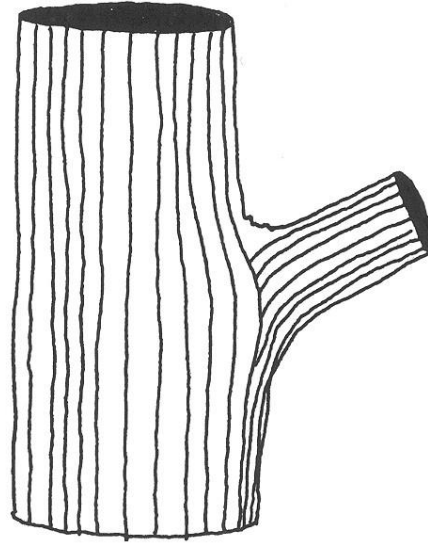


Early this year

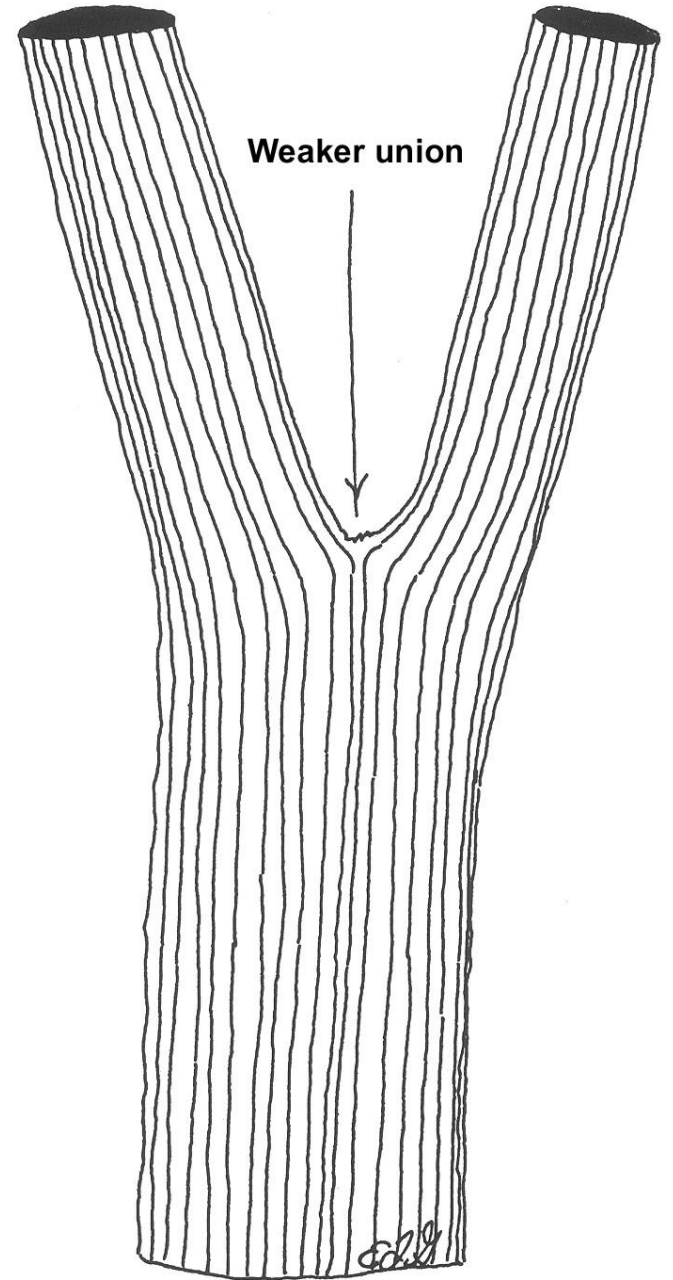


**Strong
union**

Later this year

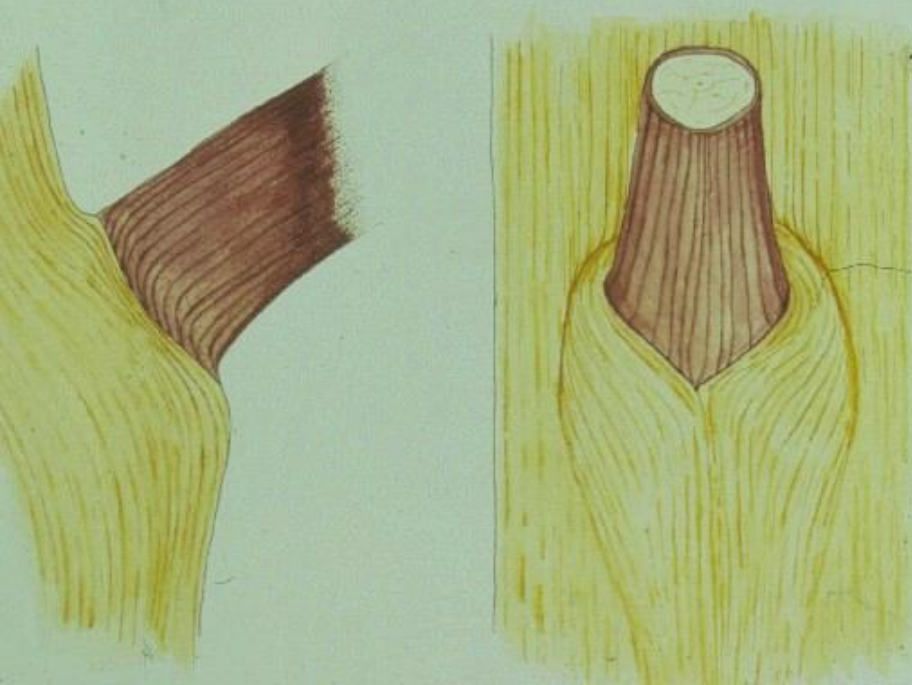
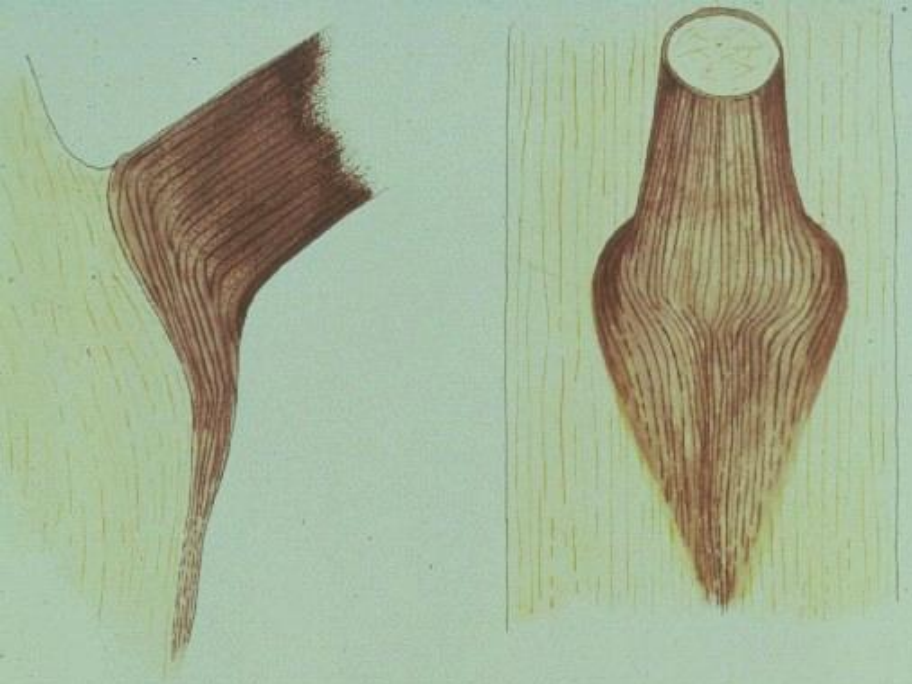


Dominant trunk with one branch



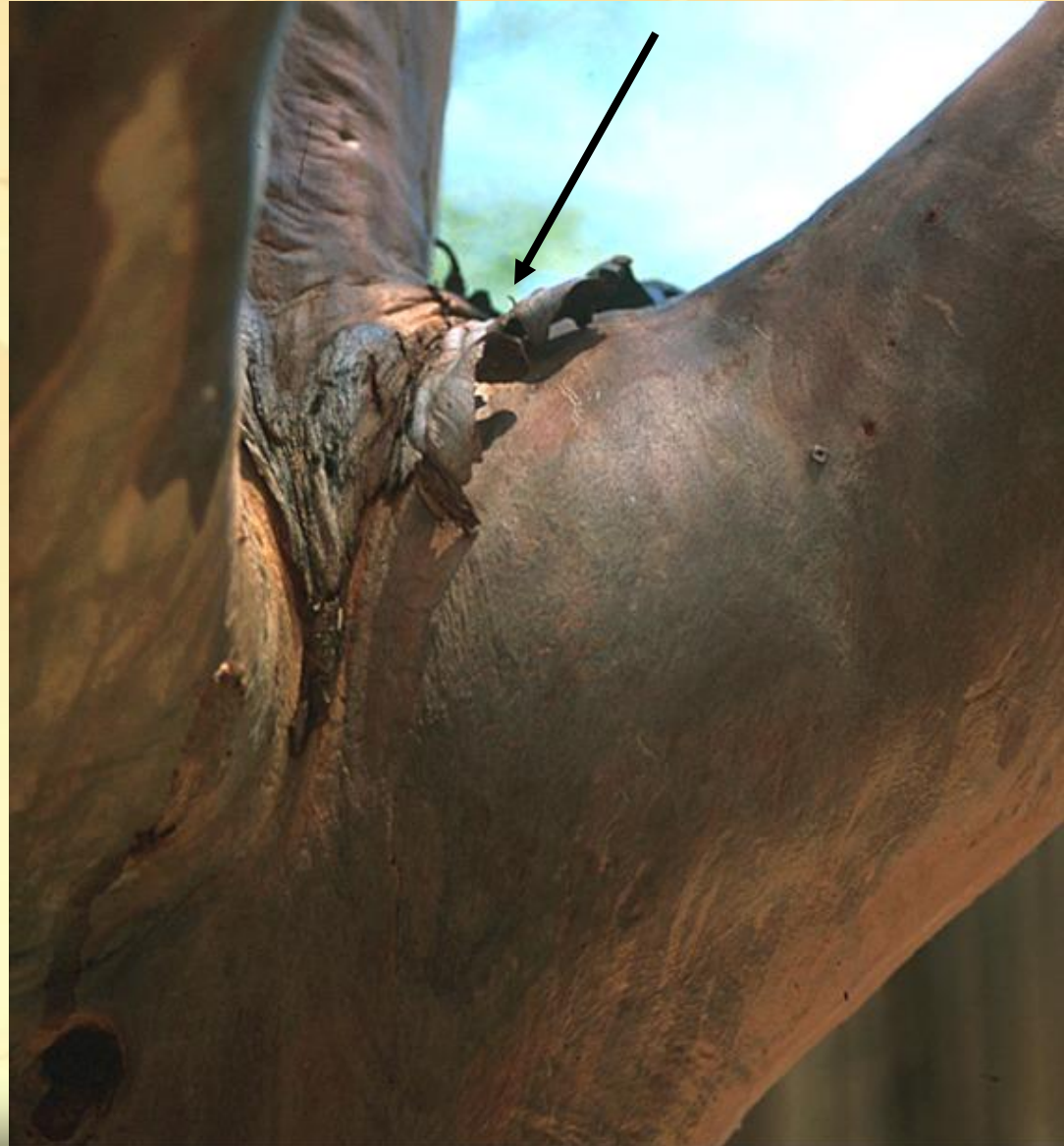
Weaker union

Codominant stems



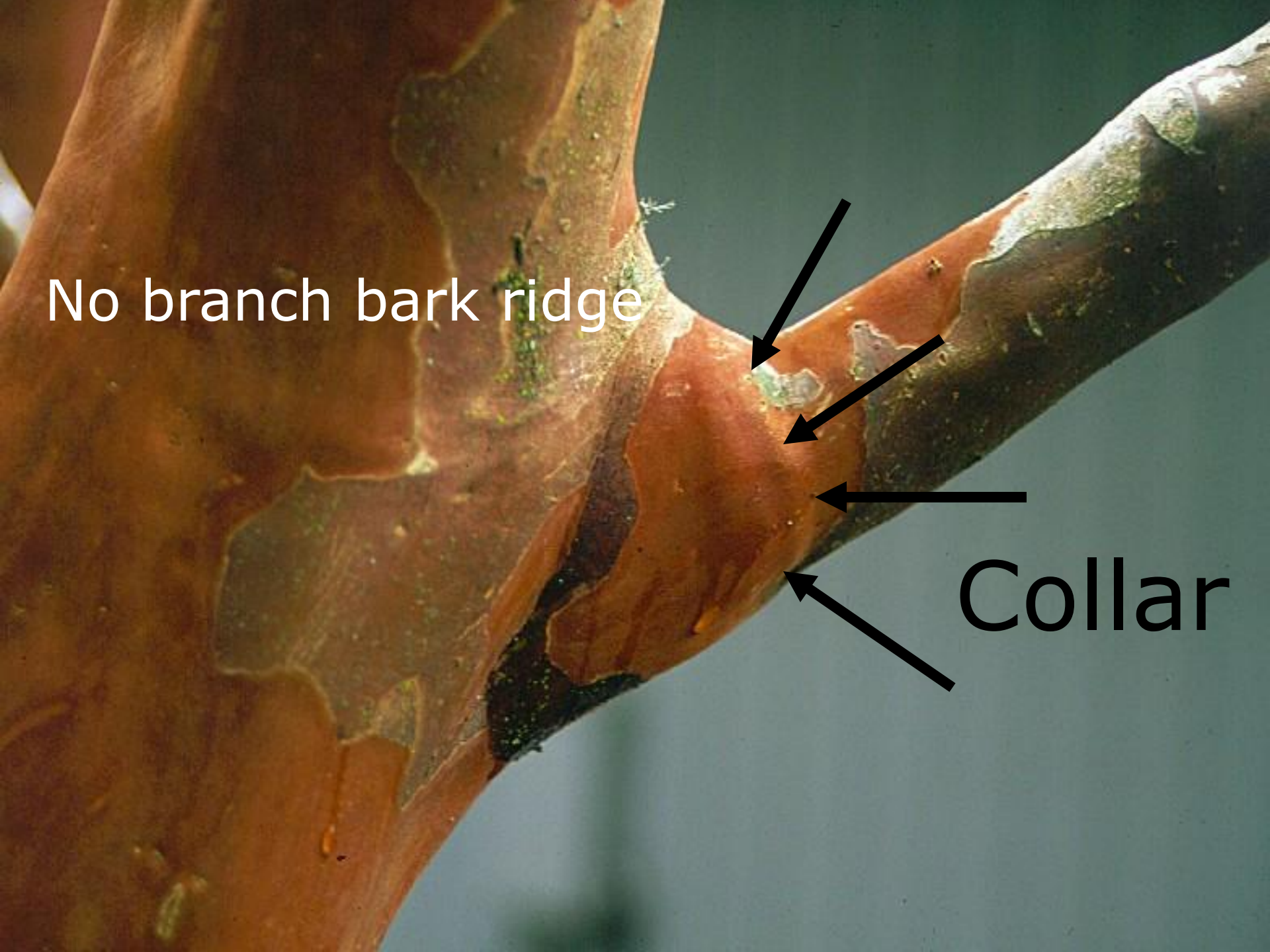
Branch bark ridge present

- Some branch unions have a prominent branch bark ridge



No branch bark ridge

Collar



Pine union



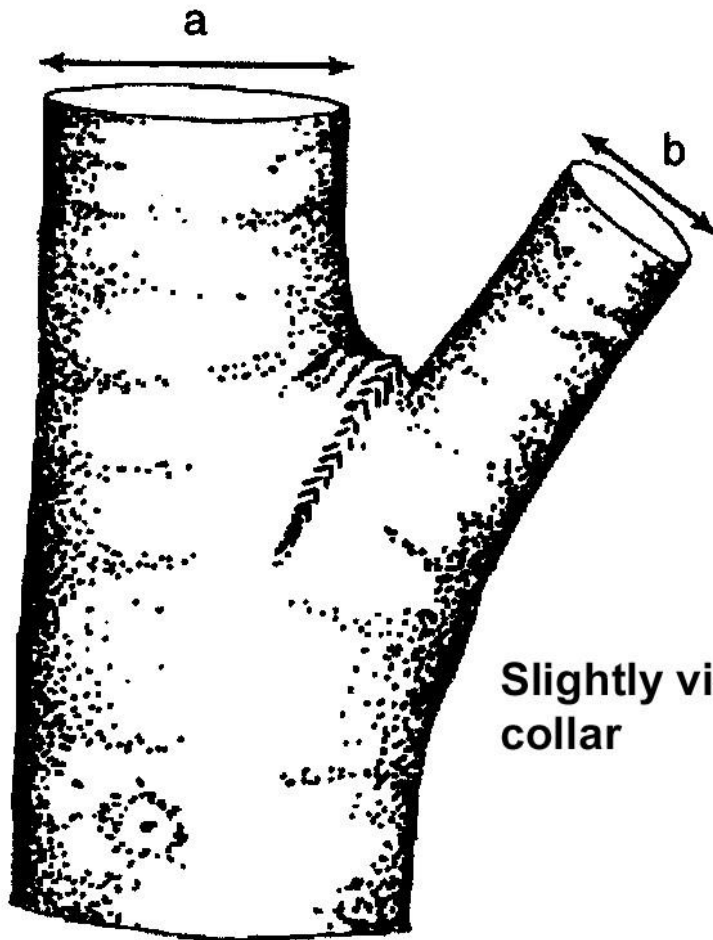
- Collar is visible as a swelling at the base of the branch
- Branch bark ridge (arrows) is visible as a dark, rough bark region on the top and sides of the union

Wood orientation at union

- Peel the bark from the union
- Note how trunk wood grows out onto the base of the branch (dotted line is edge of trunk wood)

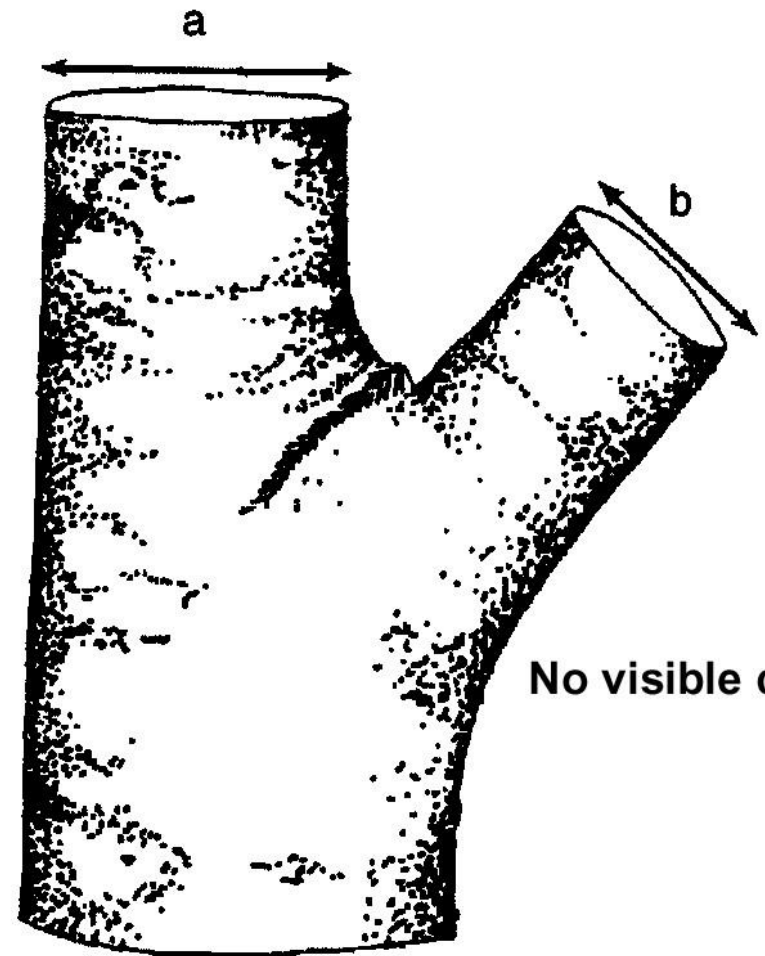


Desirable branch size



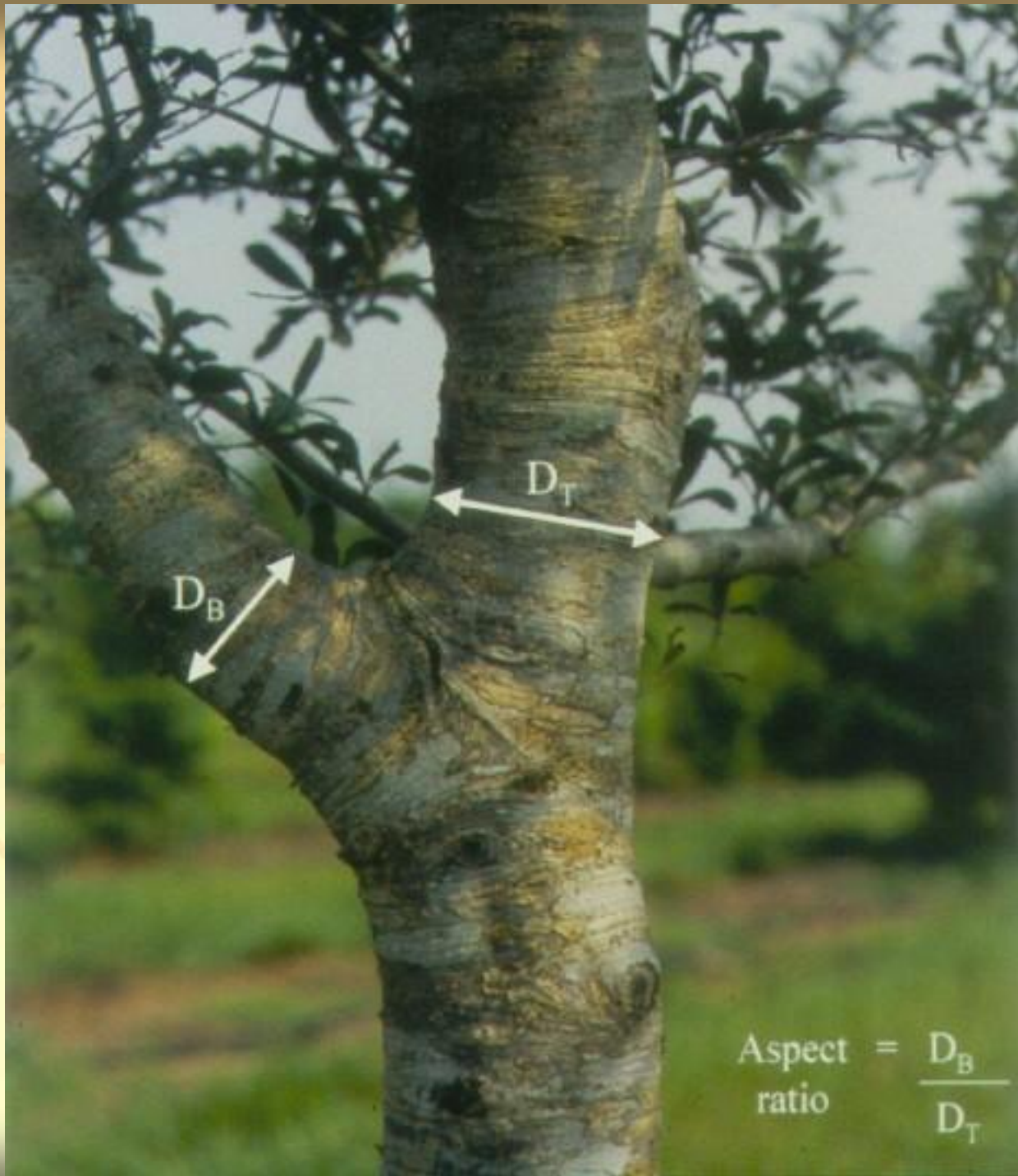
Slightly visible collar

Most preferred branch size:
 $b < .5a$



No visible collar

Preferred branch size:
 $b = .5 \text{ to } .75a$



$$\text{Aspect ratio} = \frac{D_B}{D_T}$$



Weak
union

Strong
union

What is good structure?

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4. Structurally sound tree

- Scaffold branches spaced vertically.
 - Rule of thumb: about 5% of tree's ultimate height.
- Scaffold branches spaced radially; none directly above another.
- Consistently maintain 60% L.C.R.



**Good
structure**





Stems too close together



Pruning –

Is a solution that will be
discussed in another
presentation.

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