Defects in Timber

Types of Defects

- Defects in timber can affect its;
  - strength,
  - appearance,
  - and durability.

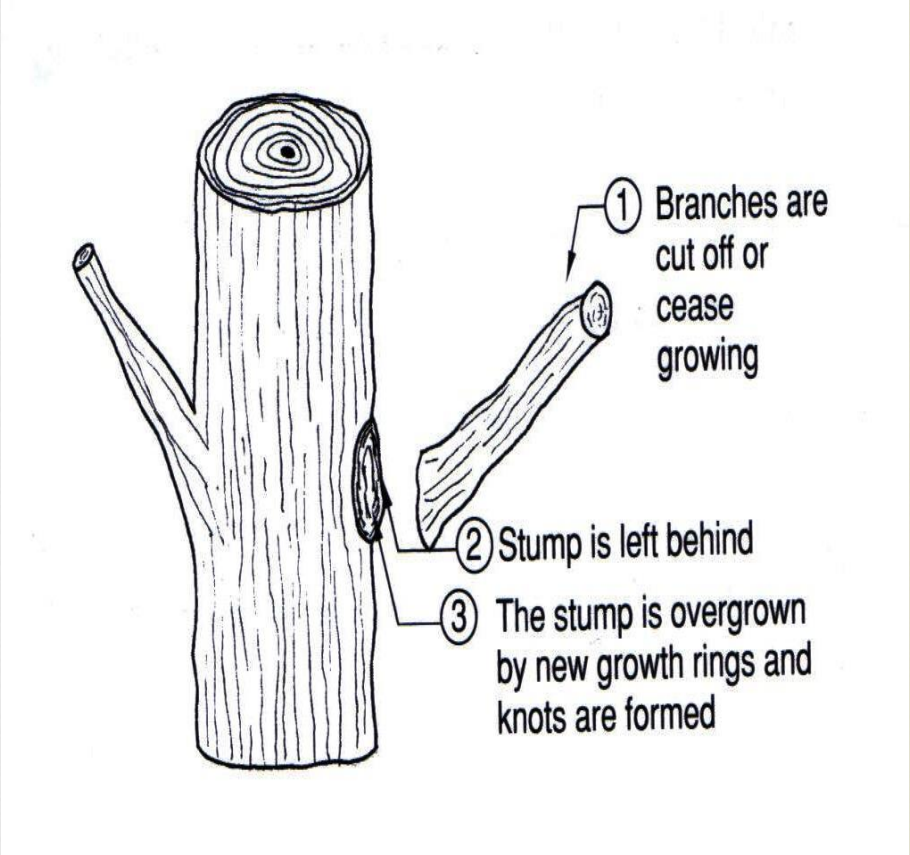
- Defects in timber are either;

1. Natural: defects that may be present in the growing tree.

1. Artificial: defects caused by the seasoning, conversion and felling process.

Natural Defects - Knots

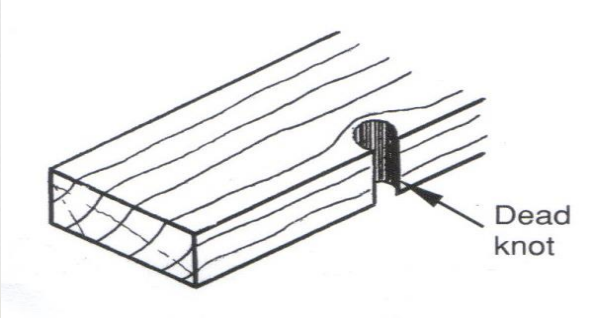
- Caused when the branches of a tree are cut off or stop growing.
- There are more knots in softwood as the branches are low to the ground.
- The grain of the timber around knots is twisted which reduces its strength



Two types of knots

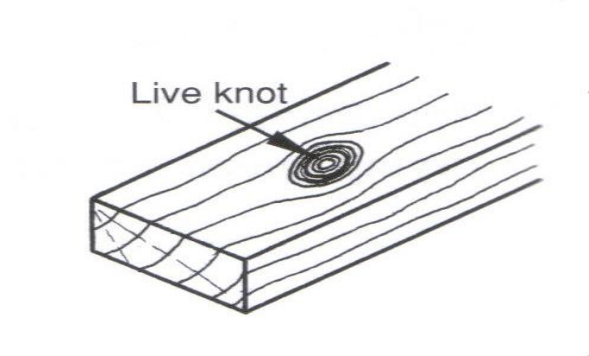
Dead Knots

- Result of a branch that stopped growing before the tree is felled.
- Dark in colour and shows sign of decay
- Weaken the timber and often become loose and fall out.



Live Knots

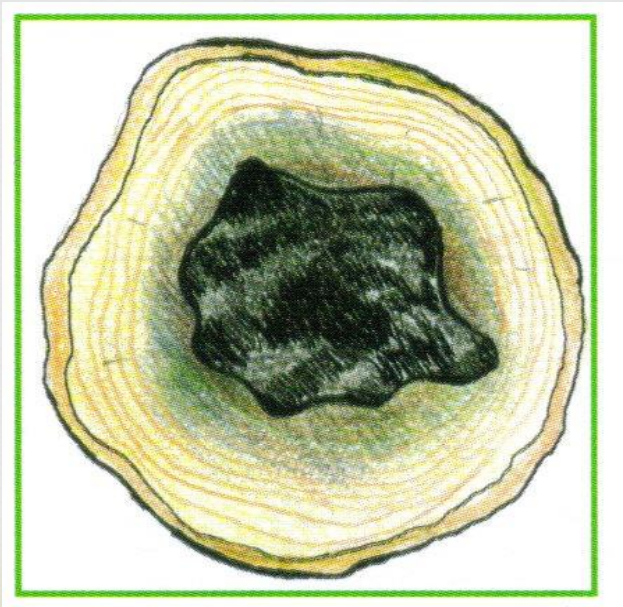
- These branches are still growing before the tree is felled.
- Light in colour and do not generally fall out.



Natural Defects

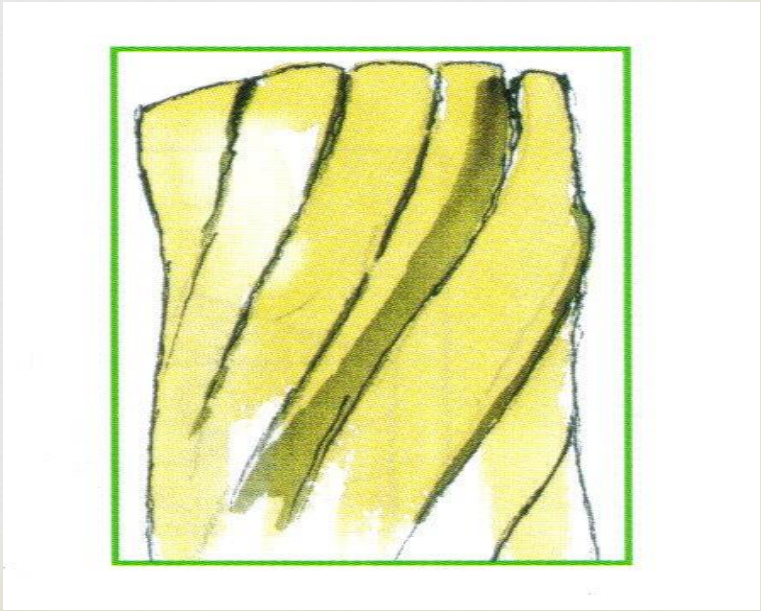
Heart rot

- Occurs when fungus attacks and rots the pith of the heartwood



Spiral Grain

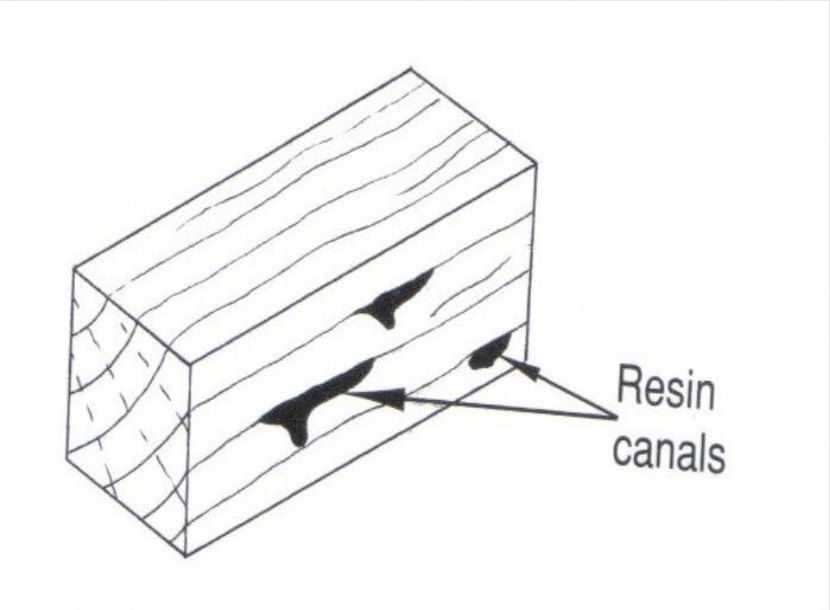
- Caused by the twisting of the tree during growth.



Natural Defects

Resin canals

- Some trees which are exposed to high winds, develop internal splits.
- These splits fill with resin or gum to make the wood resinous.

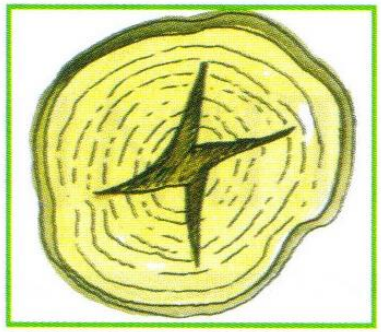


Natural / Felling Defects

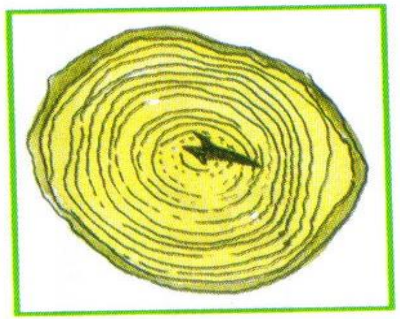
- Cracks or splits in the wood are called shakes
- These occur when adjacent (beside each other) layers of fibres separate in the end grain of wood

Types of Shakes

1. Heart and Star shakes



- Deep, wide cracks which radiate out from the centre of the log

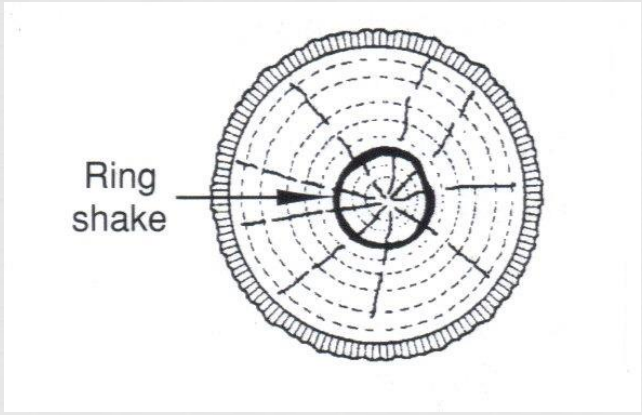


- Caused by shrinkage through old age or by rapid drying after felling

Types of Shakes

Cup and ring shakes

- Gaps between growth rings are known as cup or ring shakes.
- They can be very deep
- Caused by ;
  - Old age,



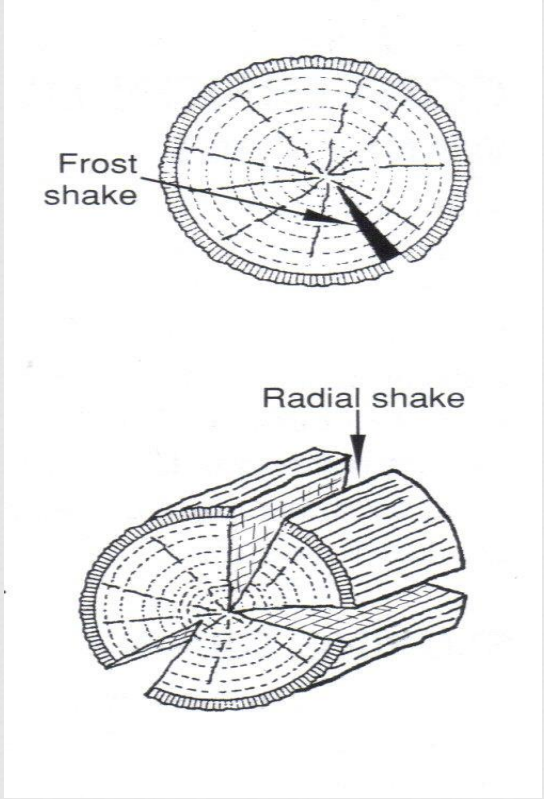
Types of Shakes

Frost shake

- This is where the wood splits inwards towards the centre and is caused by very cold weather

Radial shakes

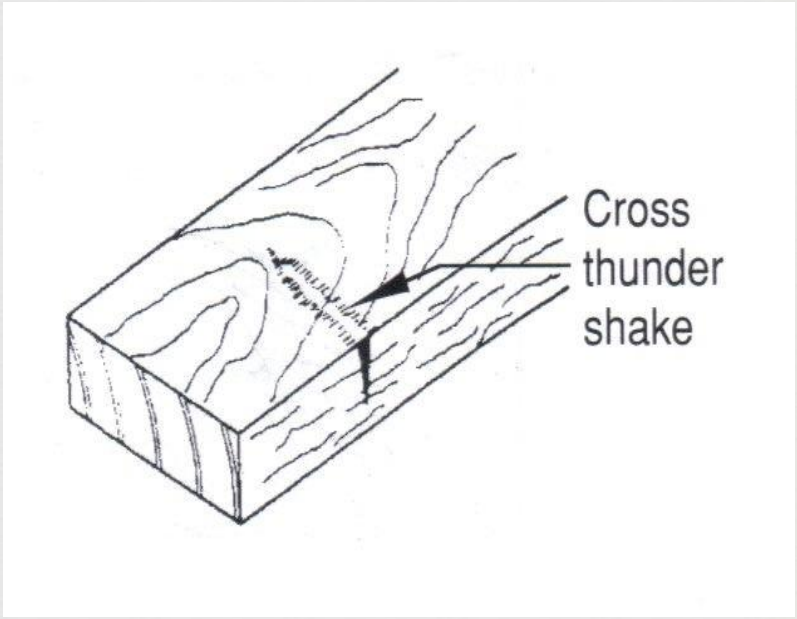
- A split along the outside of the wood caused by rapid drying (shrinkage) of the log before conversion



Types of Shakes

Cross thunder shakes

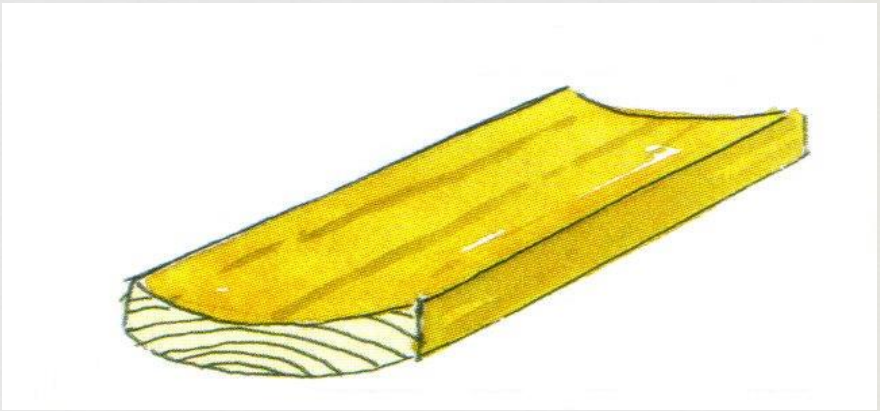
- Where the wood splits across the grain
- Caused by severe shock during felling or by lighting attack on the tree while living



Seasoning Defects

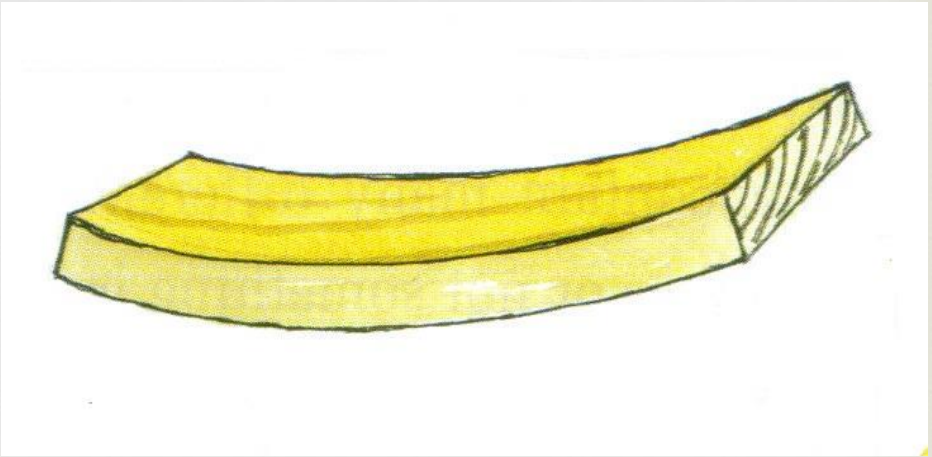
Cupping

- When you look at the end of the board it appears as a curve.
- Caused by unequal amounts of shrinkage along the growth rings.



Bowing

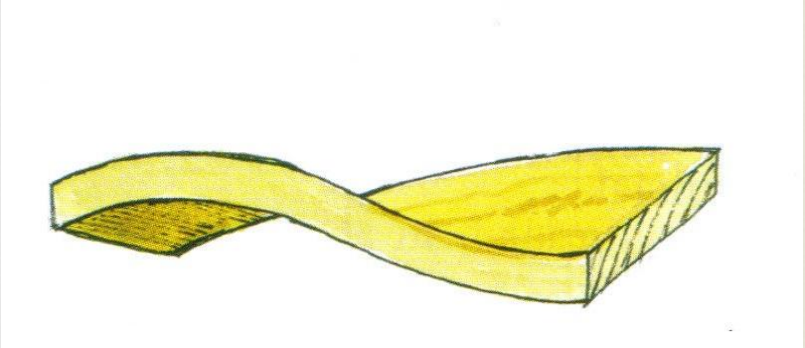
- When you look at the edge of the wood it appears curved.
- Caused by poor stacking.
  - Not enough stickers!



Seasoning Defects

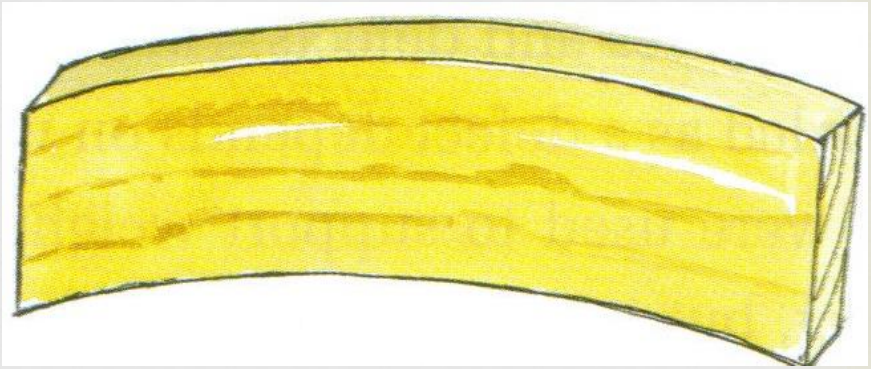
Twisting/ warping

- When the ends of the boards are twisted in opposite direction.
- Caused by shrinkage along spiral or interlocking grain.



Springing

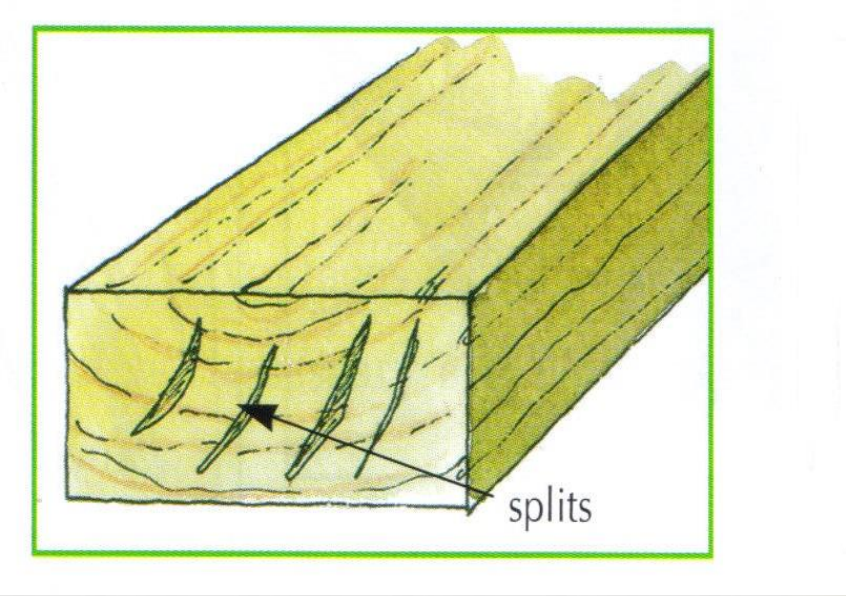
- When the face of the board remains flat and the edge bends inwards to form a curve.
- Caused by shrinkage longitudinally along irregular grain.



Seasoning Defects

End splits

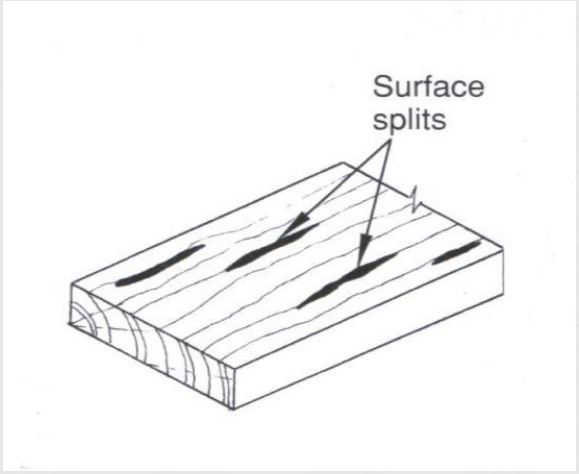
- Occurs at the exposed end of the board.
- Caused by rapid drying out from the sun
- Prevented by painting the ends of the timber with bitumous paint (water proof)



Seasoning Defects

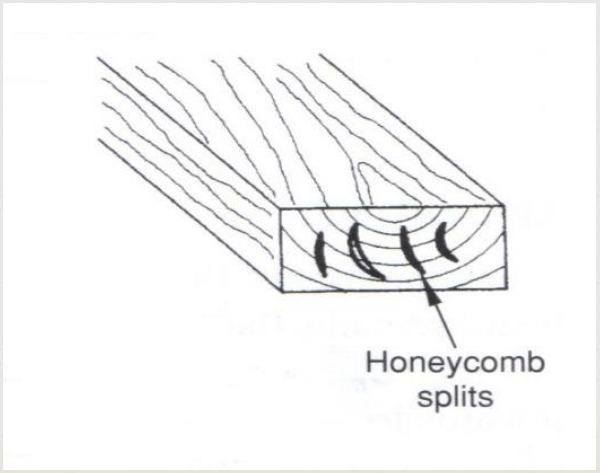
Surface splits/checks

- Usually lie along the grain.
- If there not too deep they can be planed off.
- Caused by rapid drying out on the surface of the wood.



Honeycomb splits/checks

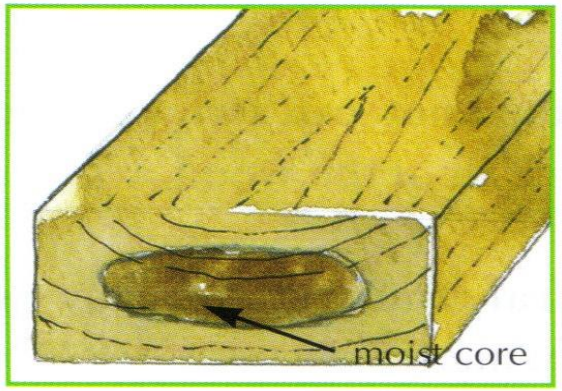
- Occur inside the board.
- Reduces strength.



Seasoning Defects

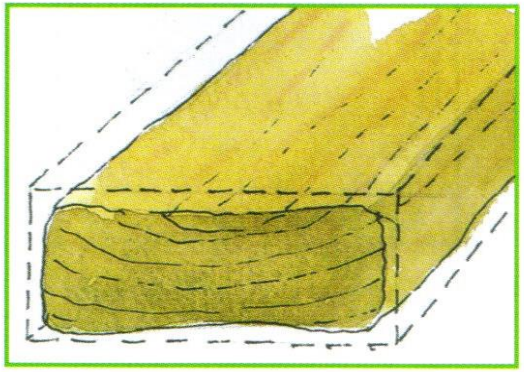
Case hardening

- Where the outside of the board is dry and hard but moisture is trapped in the centre cells of the wood.
- Caused by rapid drying.



Collapse or wash boarding

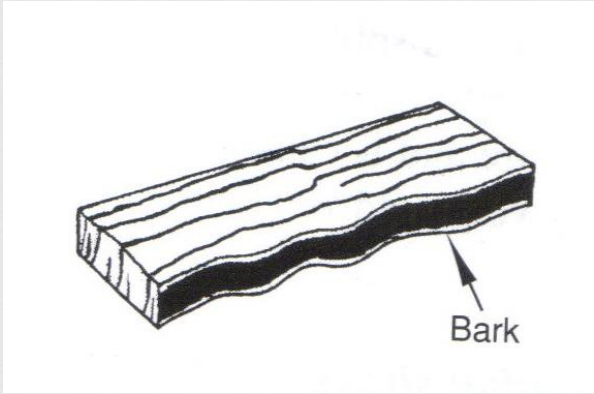
- Where the cells of the wood collapse due to high temperatures and too rapid drying.
- Prevented by using a low temperature schedule when kiln seasoning



CONVERSION DEFECTS

Waney Edge

- Occurs when the bark is left on during conversion
- Often used as a decorative feature in furniture making.



Sloping grain/short grain

- Grain does not run parallel to the edge of the board because of bad conversion
  - seriously weakens the timber