Arch 109
Building & Finish Material

TIMBER

Wood or **Timber?**

_any wood

_used in engineering construction

_termed as

timber

A D V A N T A G E S

_easily worked

_take good polish

_comparatively strong in proportion to weight

_load bearing & non-load structural connections easy

_very economic minimizing waste

_artistic design universally accepted

A D V A N T A G E S

_low thermal conductivity

high electric resistance

good sound proofing

_durable if properly treated

avoid direct exposure weather

preservatives

_reconstructed wood

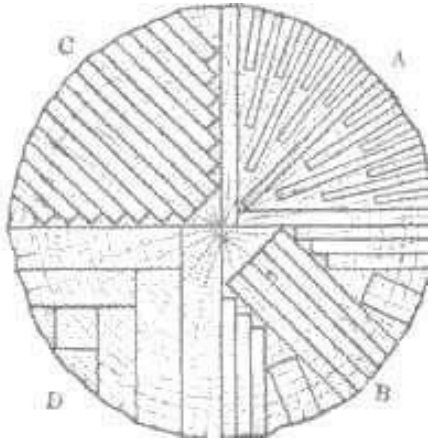
Plywood, veneers, partex

_resale value

discarded timber as fuel

Saw dust> reconstructed wood

CONVERSION



_preparation of timber from felled trees

- **trimming off branches**
- **removing bark**
- **cutting & sawing to convert**

_into

Marketable forms

LOG
LUMBER
SQUARED TIMBER
PLANK
DEAL
BATTEN
BOARD
SCANTLINGS
POLES

TYPES OF TREES

ENDOGENOUS

BOTANICAL GROUPING

EXOGENOUS

TYPES OF TREES

ENDOGENOUS

_increase both **diametrically & longitudinally**

_principally the latter by the addition of new wood intermingling the old

_**tropical & semitropical climate** like Bangladesh, India, Myanmar

_palms, betel-nut, date, bamboo

_mostly for piles, batten, posts & construction works

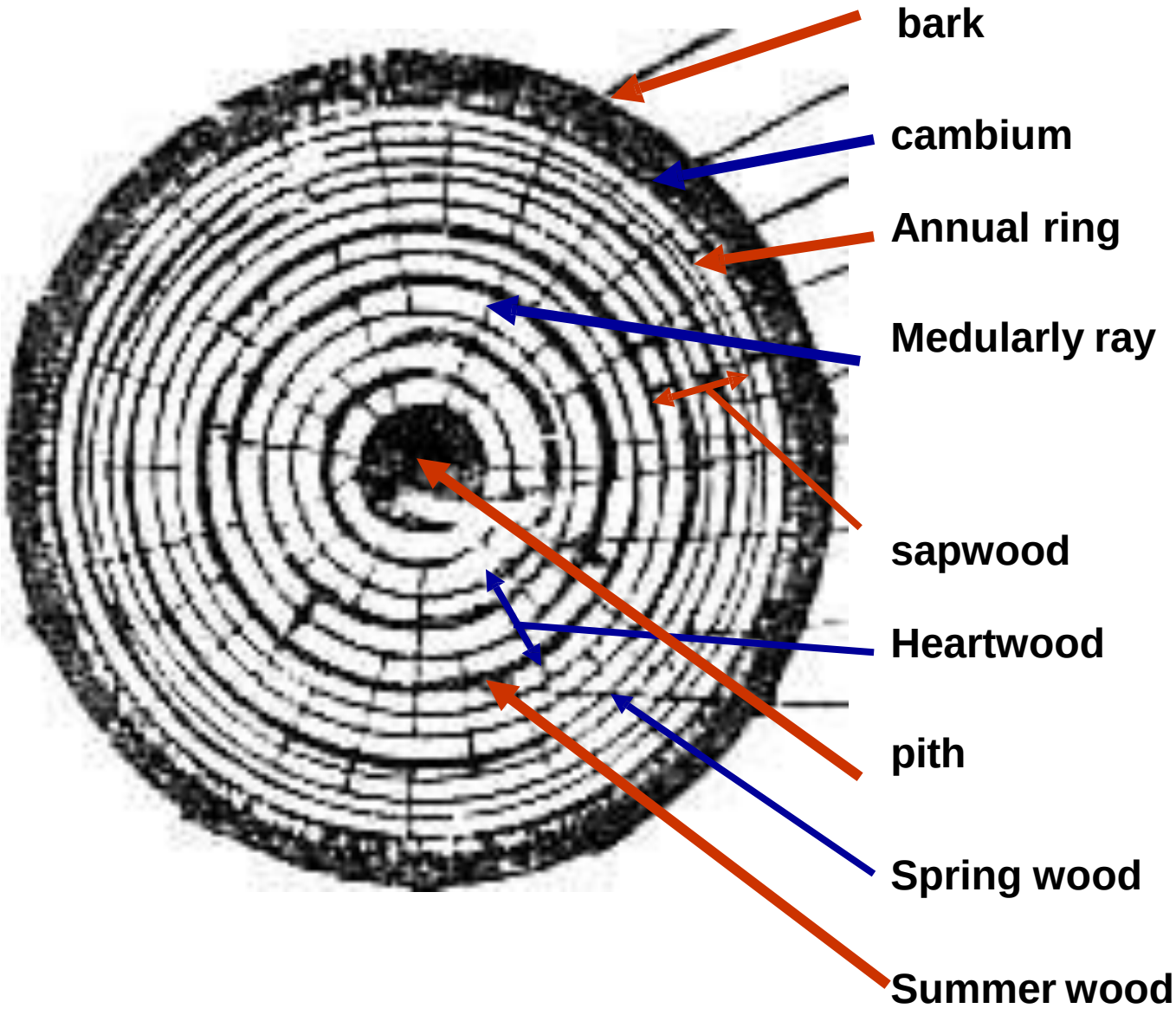
TYPES OF TREES

EXOGENOUS

_**increase in dia** by annual formation between bark and old wood by a layer of new wood

_all class of commercial wood come from this type

EXOGENOUS GROWTH



S A W I N G

5

Ordinary or cross sawing

Radial or rift sawing

Tangential or slash

sawing Quarter sawing

Combination sawing

S A W I N G

Ordinary or cross sawing

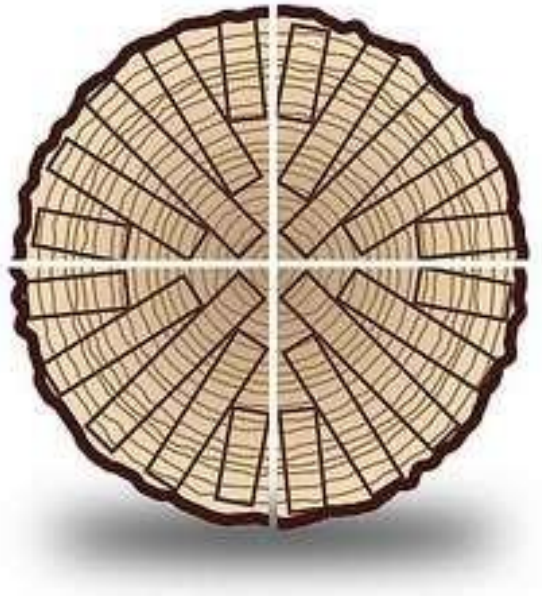
_ sawing is done approx. perpendicular to the tree/log

_ end grain cut surface

_ most common, economic, quickest method

S A W I N G

Radial or rift sawing



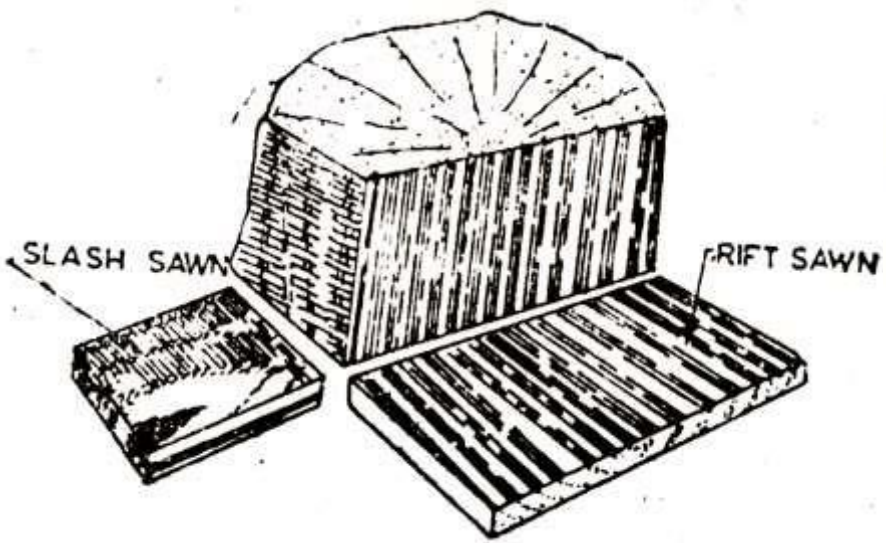
_ log is sawn parallel to medullary rays and perpendicular to annual rings

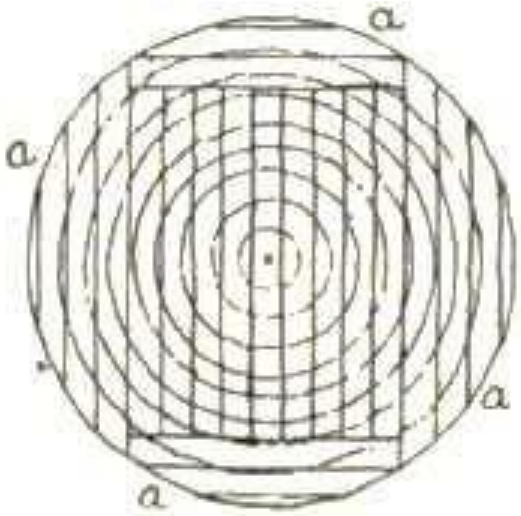
_ edge grain lumber

_ 45-90 degree

S A W I N G

Tangential or slash sawing





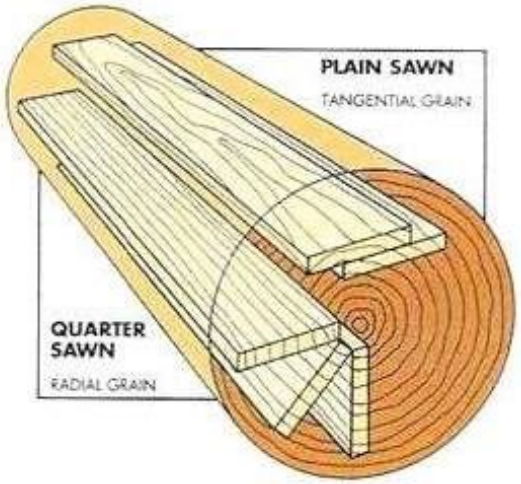
_ log is sawn perpendicular to medullary rays and more or less tangential to annual rings

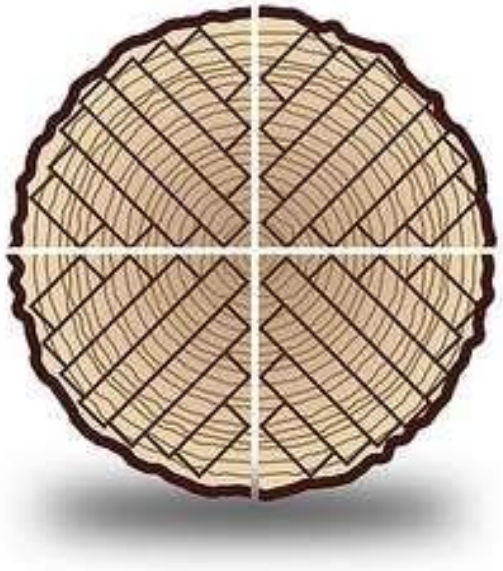
_ flat grain lumber

_ 0-45 degree

S A W I N G

Quarter sawing





_first sawing the tree in quadrant of circles

_then plain sawing and rift sawing

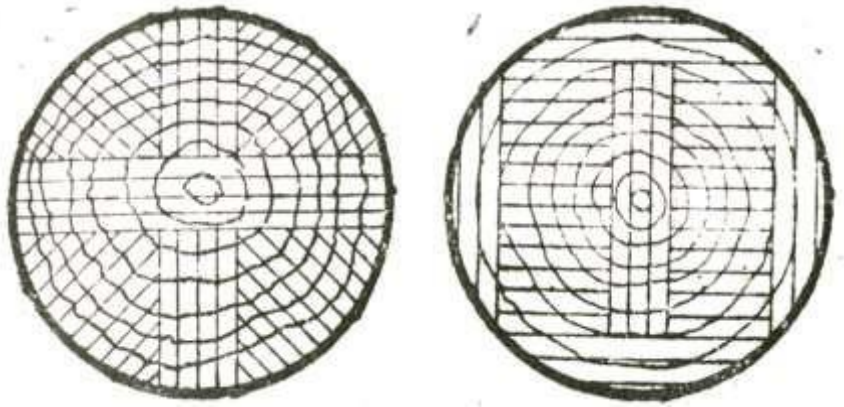
_in plain sawing, planks except the central 2/3 r not very strong

_rift sawing is costly method but produces timber of high class work

_shrinks and warps less

S A W I N G

Combination sawing



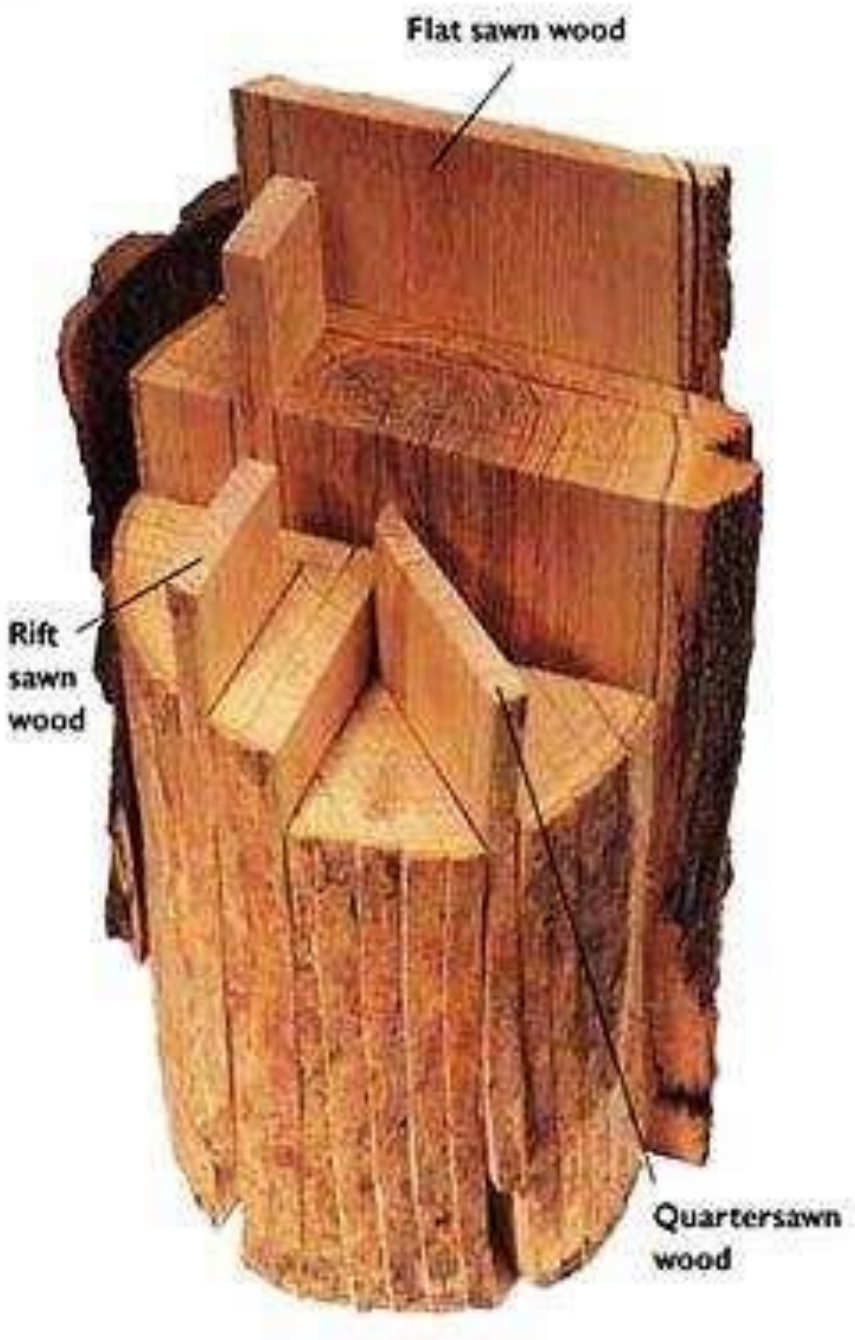
_central portion is done by ordinary sawing

_then radial sawing

_the central slices yield timber of max. strength

SAWING

OVERVIEW



D E F E C T S

any irregularity or imperfection in wood which may lower its

_strength

_durabilit
y

_utility

DEFECTS

usually

2 types

_natural defects

_due to abnormal growth

_due to rupture of tissues

_artificial defects

_due to conversion

_uses

D E F E C T S

NATURAL DEFECTS

>knots

>twisted fibres

>shakes

>upsets

>rind galls

>foxiness

>compression wood

>pitch pocket

D E F E C T S

KNOTS

_most common

_cut from the stem or branches

_encasement of the limb

_knots r small near pith, and larger near bark

_knots, if as hard as wood, called **sound knot**

_less than ½” dia, **pin knot**

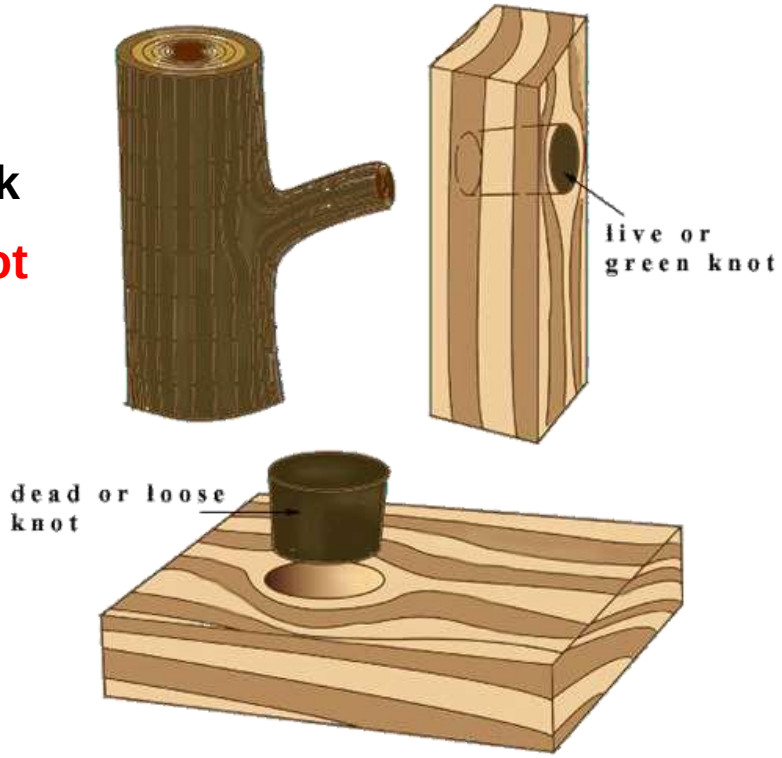
_not over 1½” dia, **standard knot**

_ over 1½” dia, **large knot**

_ in the pith, **pith knot**

_ sawn lengthwise, **spike knot**

_ decomposed, **rotten knot**



D E F E C T S

TWISTED FIBERS

_developed in a living tree
_by the wind which tend to turn the tree constantly in 1 direction
_so the fibers twist longitudinally
_reduces strength

UPSETS

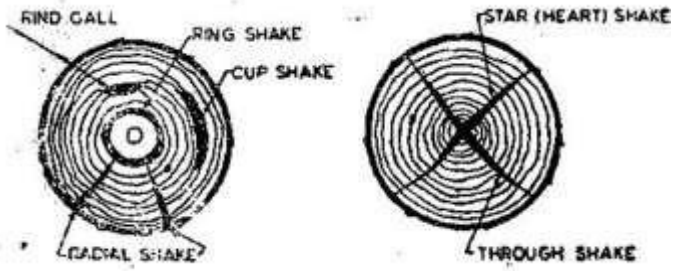
_caused by injury from crushing and shock
_usually during their growth

FOXINESS

_yellow or red stain which disfigures the wood
_generally by decay of timber
_usually found round the pith

D E F E C T S

SHAKE S



_cracks in timber, which cause the separation of wood tissue

_caused by wind and shrinkage when dry

_mostly passed maturity

_sometimes nearing maturity & felled and left un-barked for a long time

_separation occurs between annual rings, ring shake

_cracks occur between 2 faces in a piece of lumber, through shake

_extending from periphery to center radial shake, opposite is heart shake, if more than 1 star shake

_if it is curved along annual ring it is cup shake

D E F E C T S

COMPRESSION WOOD

_abnormal wood formed in lower side of branches

_relatively large annual ring

_large amount of summer wood

_very weak and less durable

RIND GALLS

_swelling cause by the growth of layers over an imperfectly cut branch

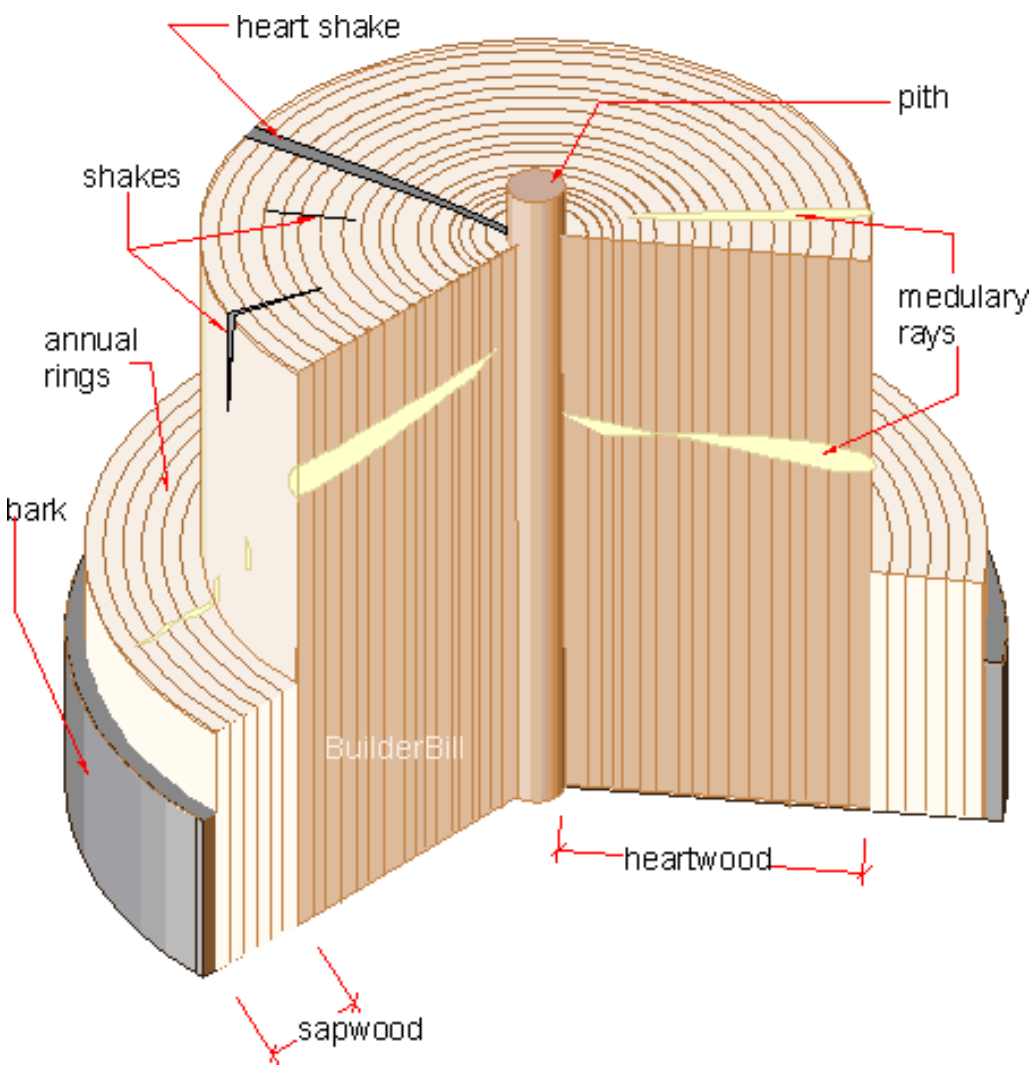
_injured when young

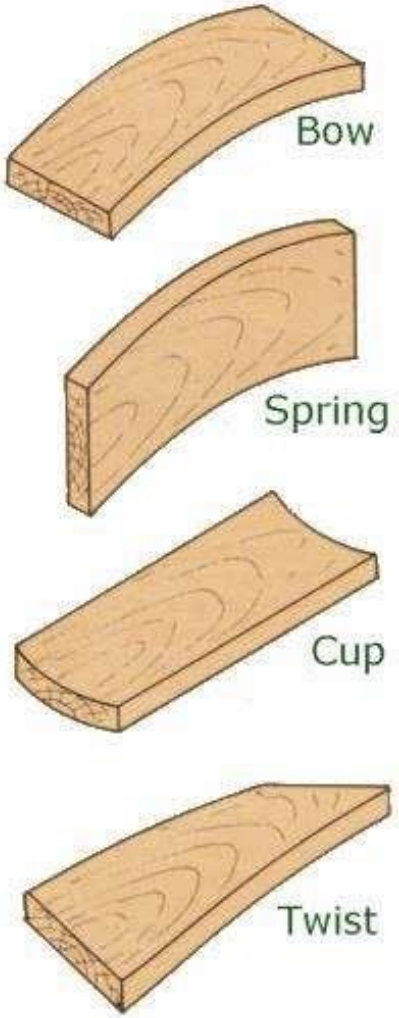
_also called excrescence

PITCH POCKETS

_A resin derived from the sap of various coniferous trees, as the pines

DEFECTS


heart shake
pith
shakes
medulary rays
annual rings
bark
BuilderBill
heartwood
sapwood


Bow
Spring
Cup
Twist

D E F E C T S

ARTIFICIAL DEFECTS

>warping

>splitting/cracking

>fungal action

>insect/worm actions

Thank you.