Timber and Wood

- *Timbrian* = build
- Timber means wood suitable for building / carpentry / engineering purposes

Standing timber	Timber contained in a living tree
Rough timber	Obtained after felling a tree
Converted timber	Timber sawn & cut into suitable commercial

Classification of trees

Used for engg purposes

Exogenous
(Grow outwards)

Endogenous
(Grow inwards and longer)

Eg: - Bamboo, cane, palm, coconut tree

Conifers

- Ever green trees
- Leaves do not fall till new ones grows
- Bears cone shaped fruits
- Eg: Mango tree

→ Soft wood

Deciduous

- Broad-leaf trees
- Leaves fall in autumn and new ones appear in spring
- Mostly for engg purposes
- Eg: Teak

→ Hard wood

Structure of a tree

1. **Micro structure**
   Timber studied under microscope

2. **Macro structure**
   Timber studied with naked eye

Micro structure

- Timber consists of living and dead cells
- Living cells – membrane, protoplasm, sap, core

1. Conductive cells

Transfer nutrients from roots to various parts of tree

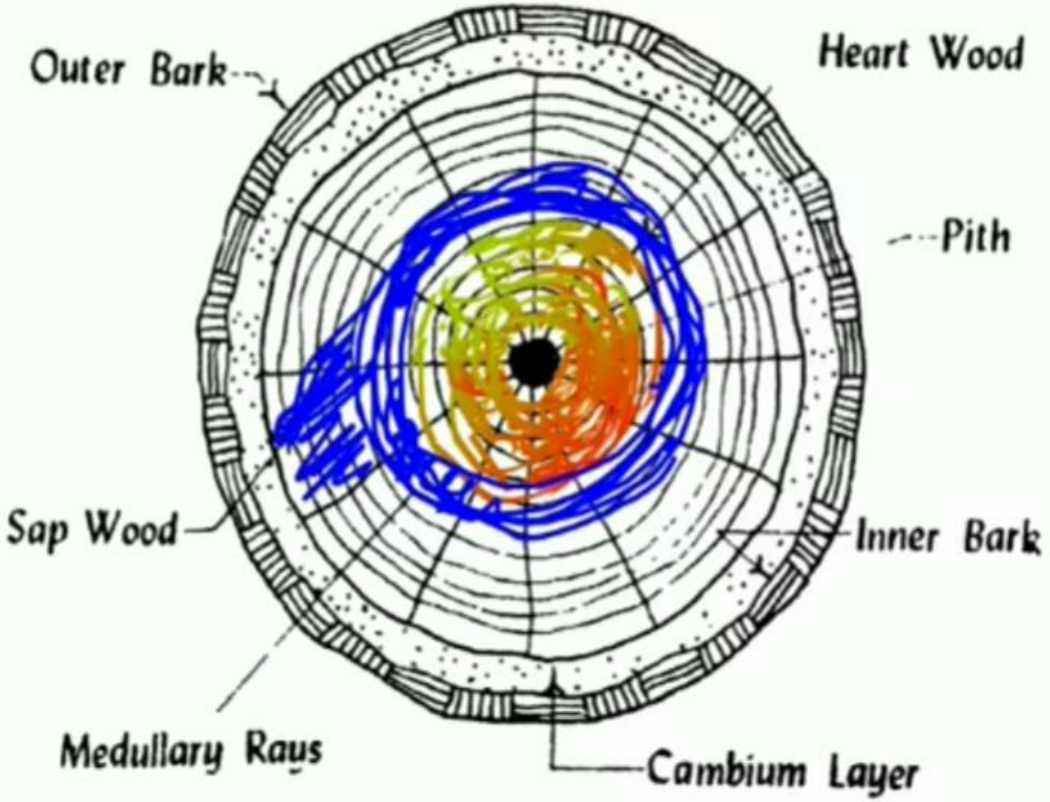
2. Mechanical cells

Tightly interconnects cells and imparts strength to tree

3. Storage cells

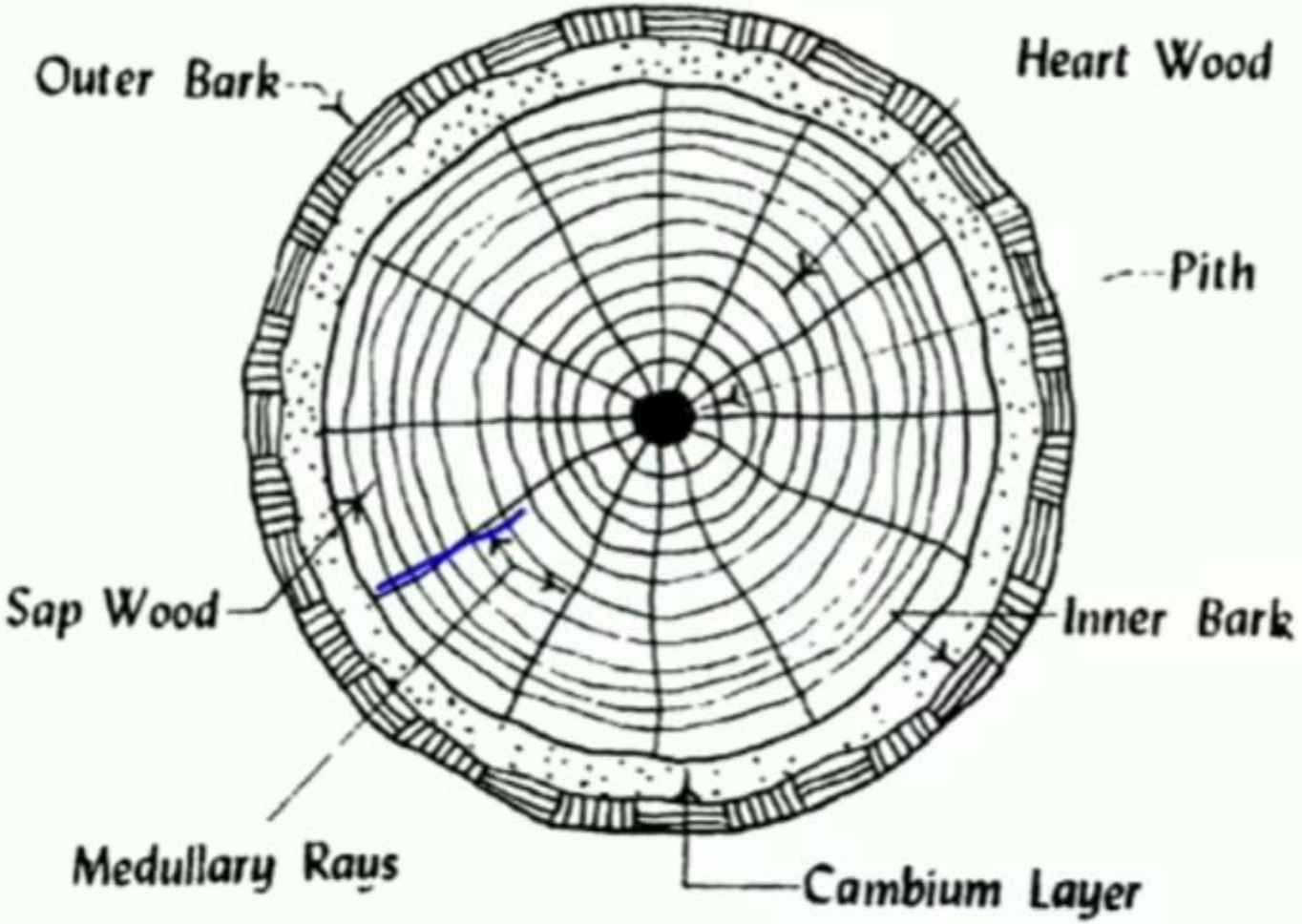
Extra nutrients are stored

Macro structure



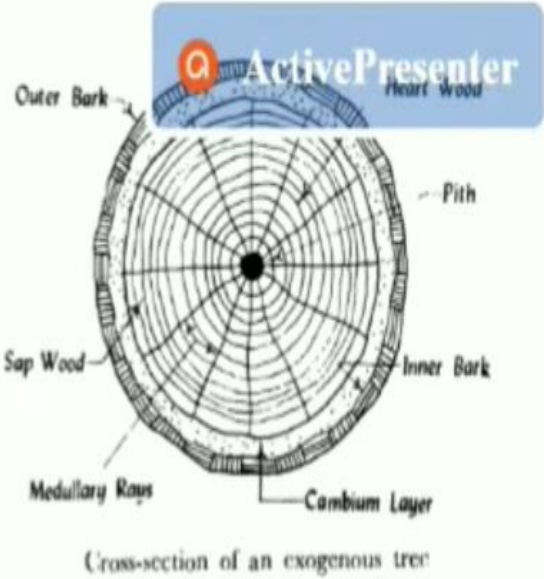
Cross-section of an exogenous tree

Macro structure



Cross-section of an exogenous tree

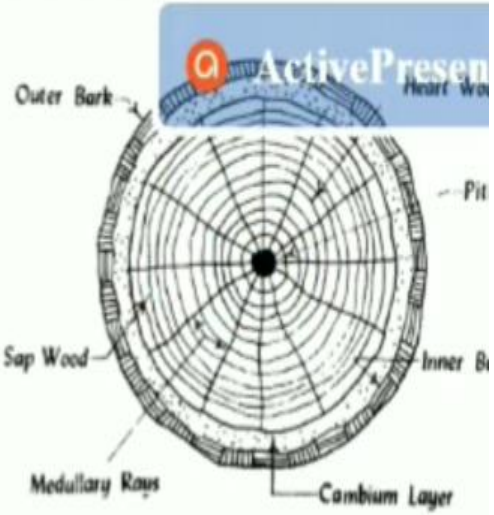
- **Pith (core/medulla)**
  - → Innermost central portion
  - → Supply nutrients at young age
- **Heart wood**
  - → Inner annular rings surrounding pith
  - → Usually dark in colour
  - → Used for engineering purposes



Cross-section of an exogenous tree

- **Sap wood (Albernum)**
  - → Outer annular rings b/w heart wood and cambium layer
  - → Light weight and light colour
  - → It take active part in growth of tree

- **Cambium layer**
  - → Thin layer of sap b/w sap wood and inner bark
  - → This get converted into sap wood



- **Inner bark**
  - → Inner layer covering (protection to) cambium layer
- **Outer bark (Cortex)**
  - → Outermost protective layer of a tree
- **Medullary rays**
  - → Thin radial layers extending from pith to cambium layer
  - → Hold together annual rings of heart wood & sap wood.

Defects in timber

due to

ActivePresenter

Conversion

1. Chip mark
2. Diagonal grain
3. Torn grain
4. Wane

Fungus

1. Blue stain
2. Sap stain
3. Dry rot
4. Wet rot
5. Brown rot
6. White rot
7. Heart rot

Natural forces

1. Burls
2. Callus
3. Chemical stain
4. Coarse grains
5. Dead wood
6. Druxiness
7. Foxiness
8. Knot
9. Rind gall
10. Shake
    1. Cup shake
    2. Ring shake
    3. Heart shake
    4. Star shake
    5. Radial shake
11. Twisted Fibre
12. Upset or rupture
13. Water stain
14. Wind crack

Insects

1. Beetles
2. Marine borers
3. Termites

Seasoning

1. Check
2. Split
3. Cup
4. Bow
5. Twist
6. Warp
7. Collapse
8. Case hardening
9. Radial shake
10. Honey combing