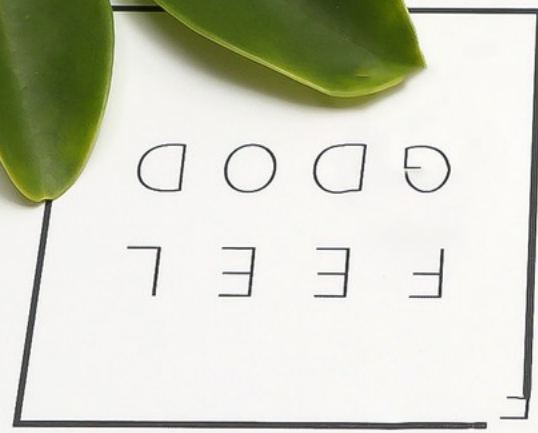
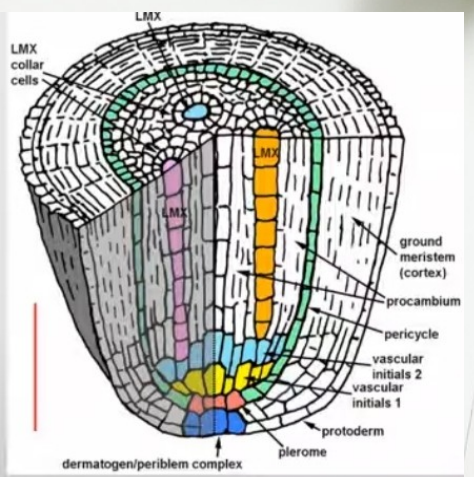


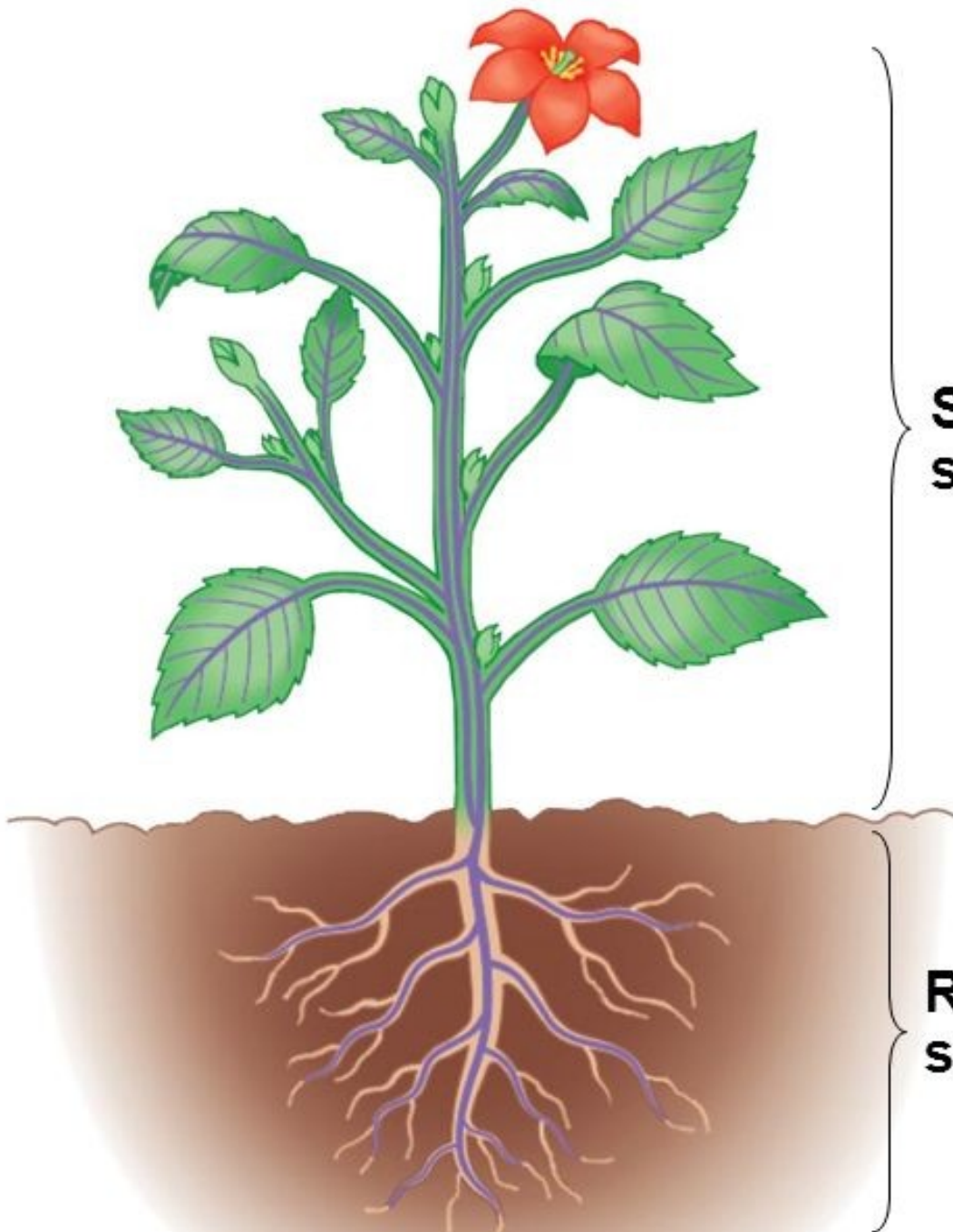


Root Apical meristem RAM

Root Apical meristem
organization
Detail account

By .. Md.Arshad kazi
Government pg college
korba





Shoot system

- Above ground
- Stems, leaves

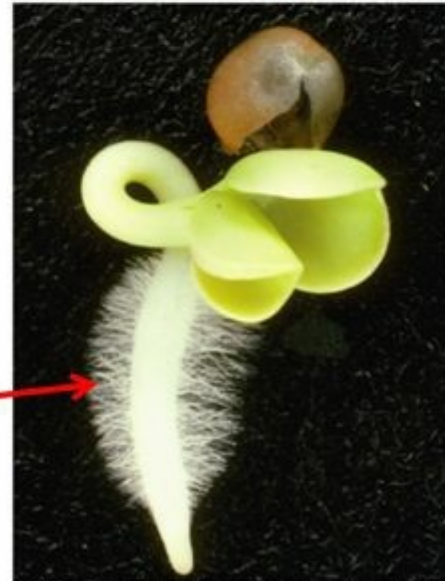
Root system

- Underground (usually)
- Roots

A. Roots

- Anchors plant, absorbs H_2O & minerals, stores sugars/starches
- Root hairs – tiny extensions of epidermal cells, increase surface area for H_2O and mineral absorption
- Mycorrhizae: symbiosis with fungi

Root hairs



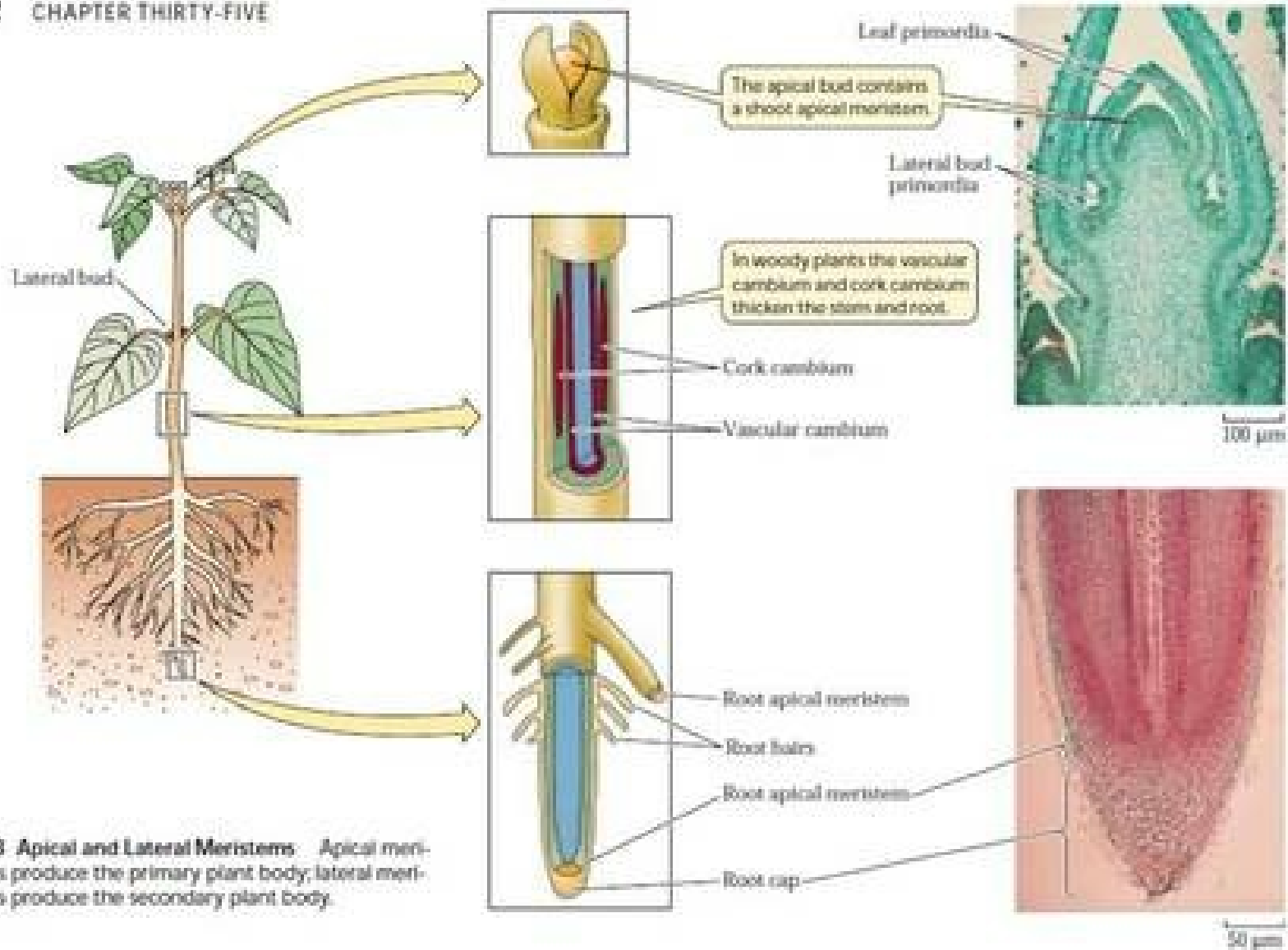


Fibrous Roots	Taproots
<ul style="list-style-type: none">■ Mat of thin roots spread just below surface	<ul style="list-style-type: none">■ One thick, vertical root
<ul style="list-style-type: none">■ Shallow	<ul style="list-style-type: none">■ Many lateral (branch) roots
<ul style="list-style-type: none">■ Increased surface area	<ul style="list-style-type: none">■ Firmly anchors
<ul style="list-style-type: none">■ Monocots	<ul style="list-style-type: none">■ Stores food in root
	<ul style="list-style-type: none">■ Dicots

Fibrous Root
(scallion)

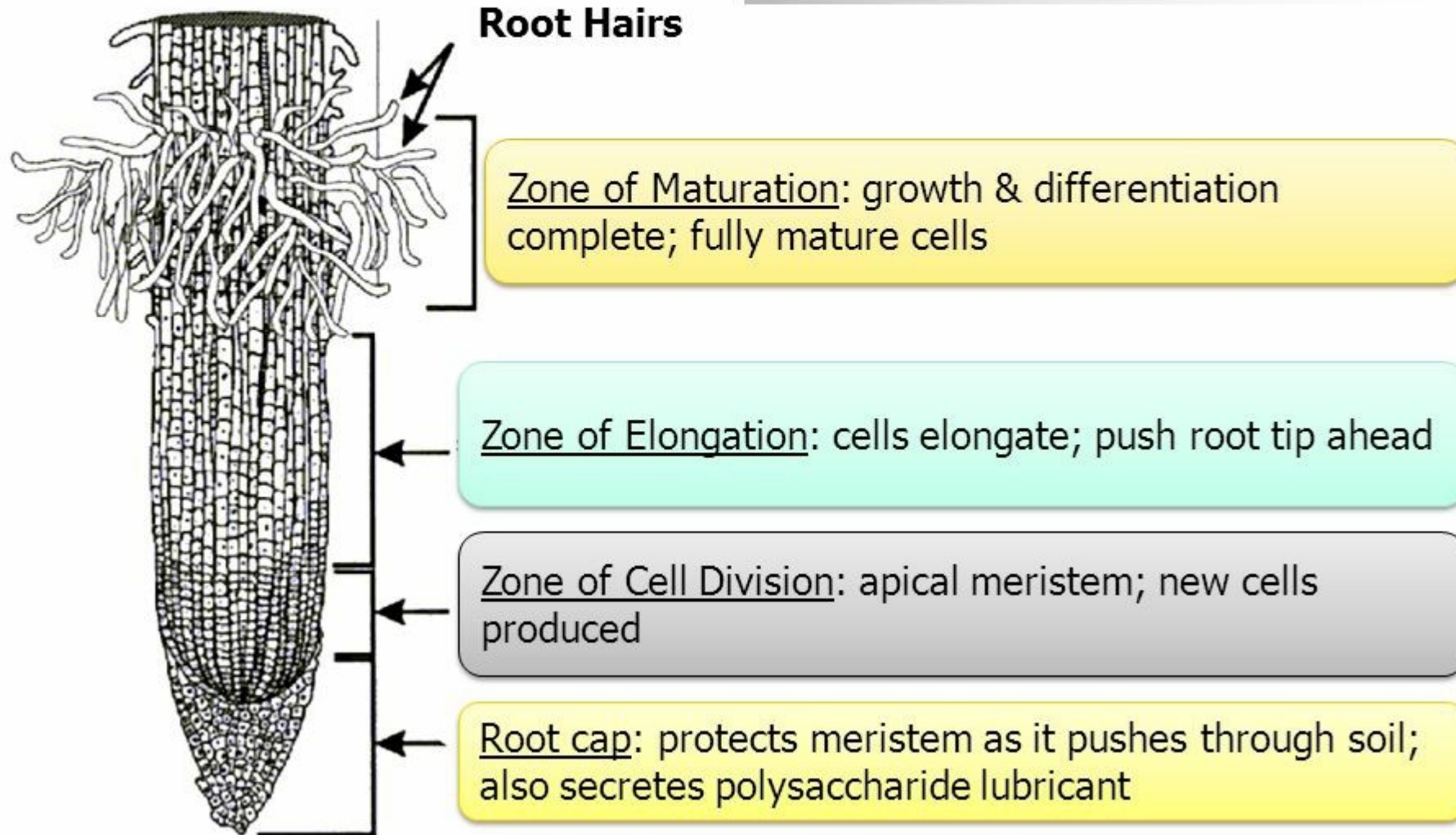


Taproot
(carrot)



35.13 Apical and Lateral Meristems. Apical meristems produce the primary plant body; lateral meristems produce the secondary plant body.

Concept 35.3 Primary growth lengthens roots and shoots



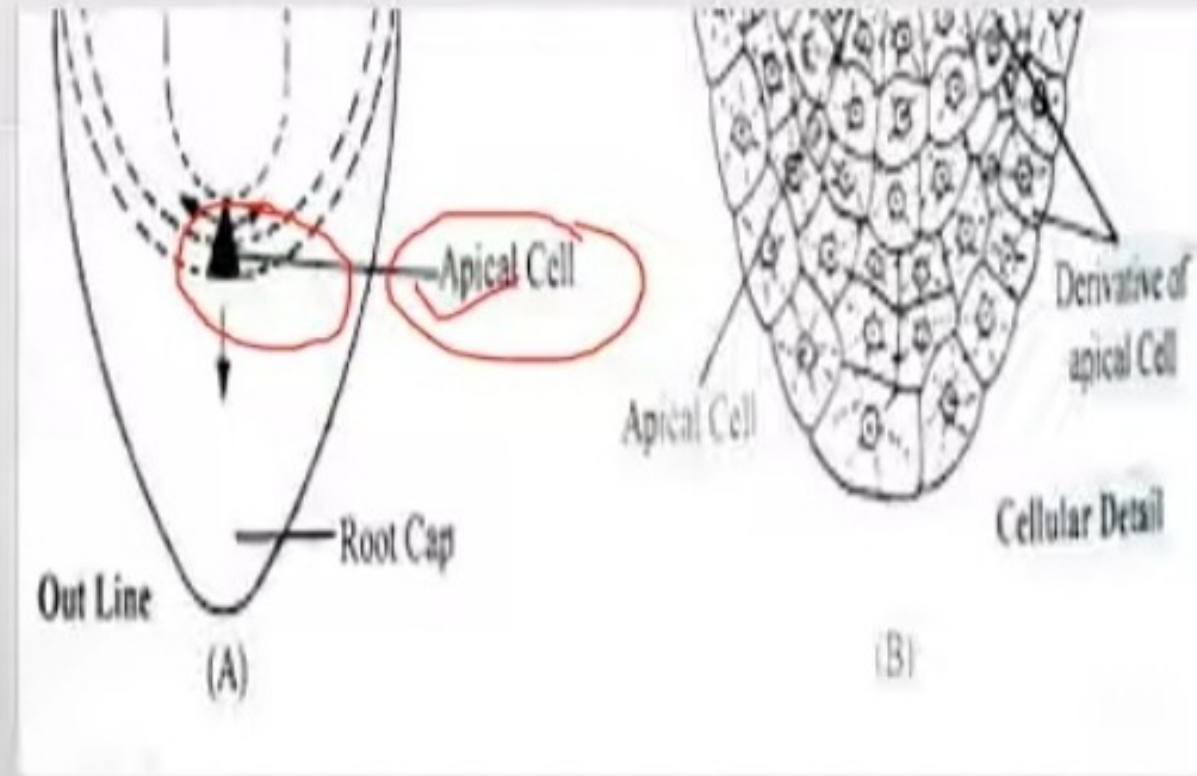
Root apex organization

- **Several theories have been proposed to describe the root apex organization .**
- 1. Apical cell Theory**
 - 2. Histogen Theory**
 - 3. Korper-Kappe Theory**

THEORIES OF ROOT APEX ORGANIZATION

APICAL CELL THEORY:

- ✓ Proposed by **Nageli** (1858).
- ✓ Root is formed by activity of single apical cell.
- ✓ Observed that vascular cryptogams have single tetrahedral apical cell.
- ✓ Upper three sides divide to form root body and lower side form basal portion.



Source:

https://www.ganong.com/search?q=apical+cell+theory+of+root+apex&ibm=web&ref=2&rkf=64r257r4h0z0rHTQTRv0L2CmDhAAM80p=000=apical+cell+th&gs_l=CqNubWt2A3uAAyPABNFS46BAppCeb8AgAFENSCAgAELEEMhDy0A2uFCAGQ0DvIn8wA413DE2M82gAF84E9jgAF8u0U2L8N8Yh0ESYF_jFvqg1AR4A1A540C1A76D8aFDM74u04yW0m4FA=AF8qg1L23d03dpm1jpbWtA0C2&sc=em=www.ganong.com/240m8u03uPIL44w&rb=6h7/&trw=130&lang=en&ad=india&ip=IN/IN&inv=af=www.ganong.com/240m8u03uPIL44w&rb=6h7/

Quiescent center theory

Quiescent centre

- Quiescent centre concept given by Clowes (1956) in maize.
- According to this, there is an inactive centre in the root apex which is called quiescent centre (having low DNA, RNA, protein) and it acts as a reservoir of active initials.

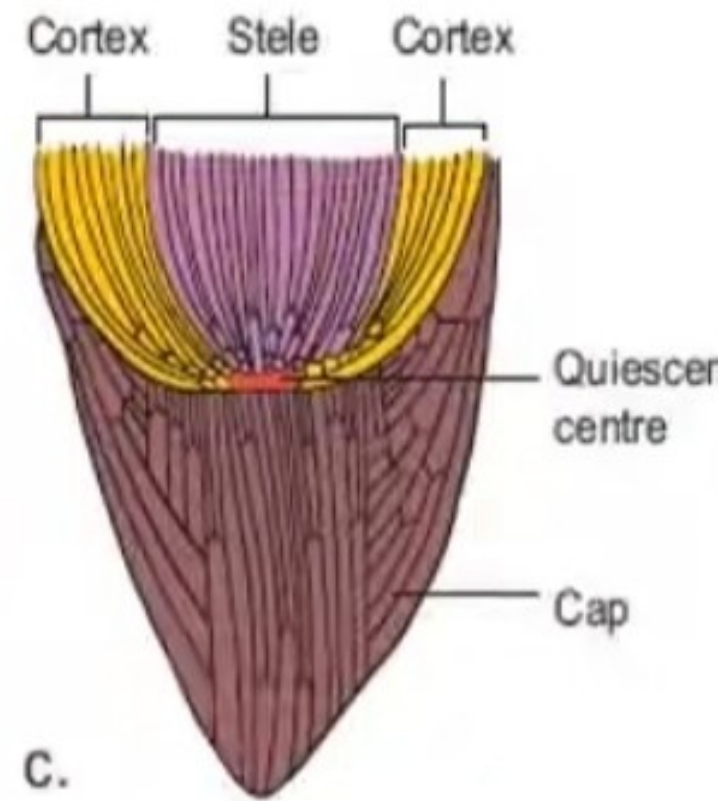
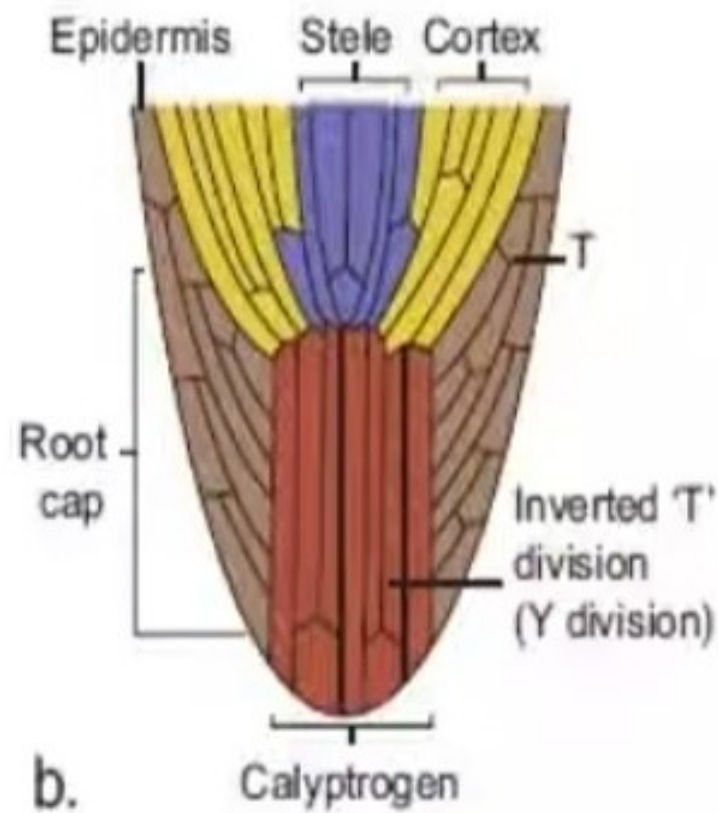
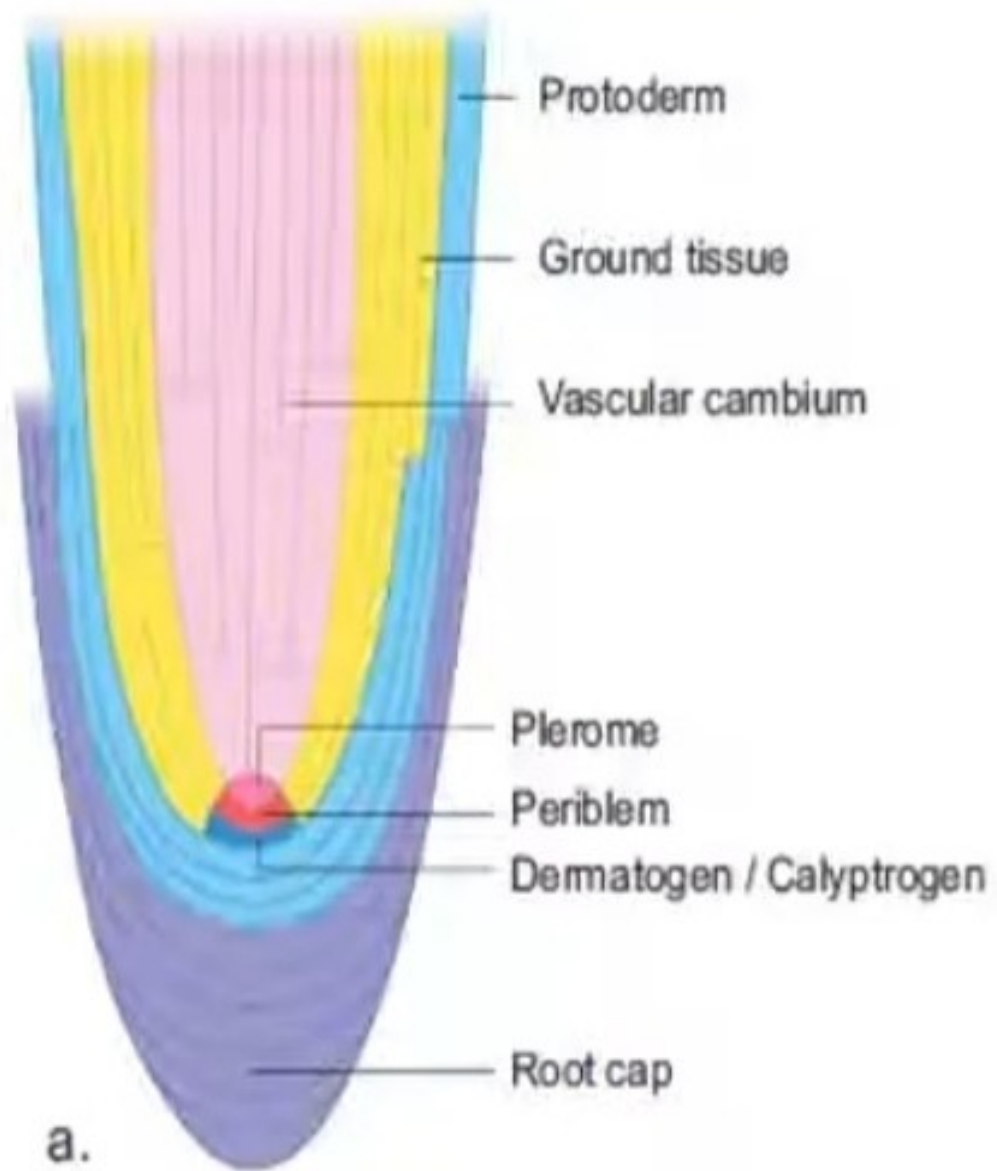
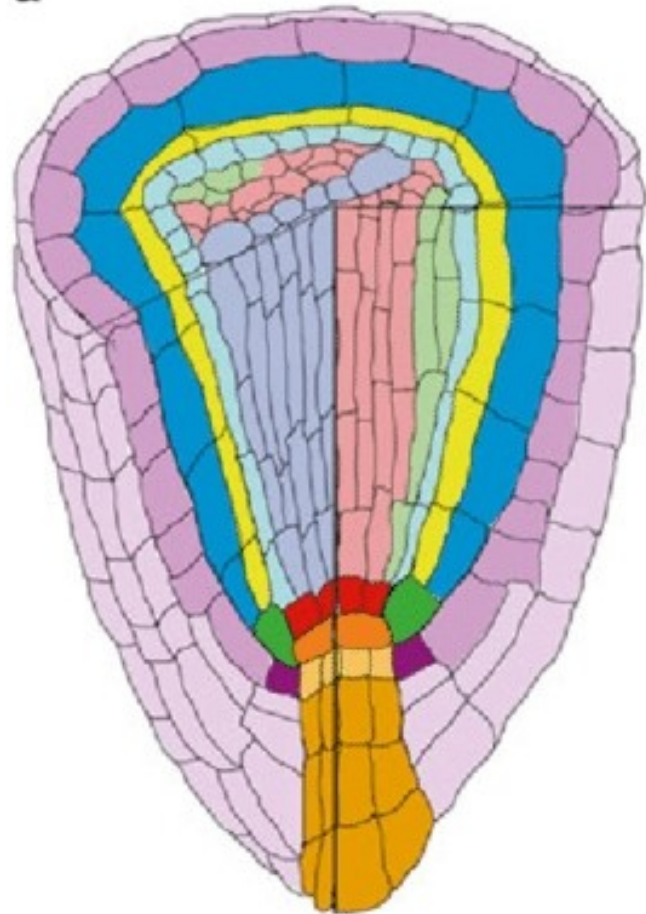
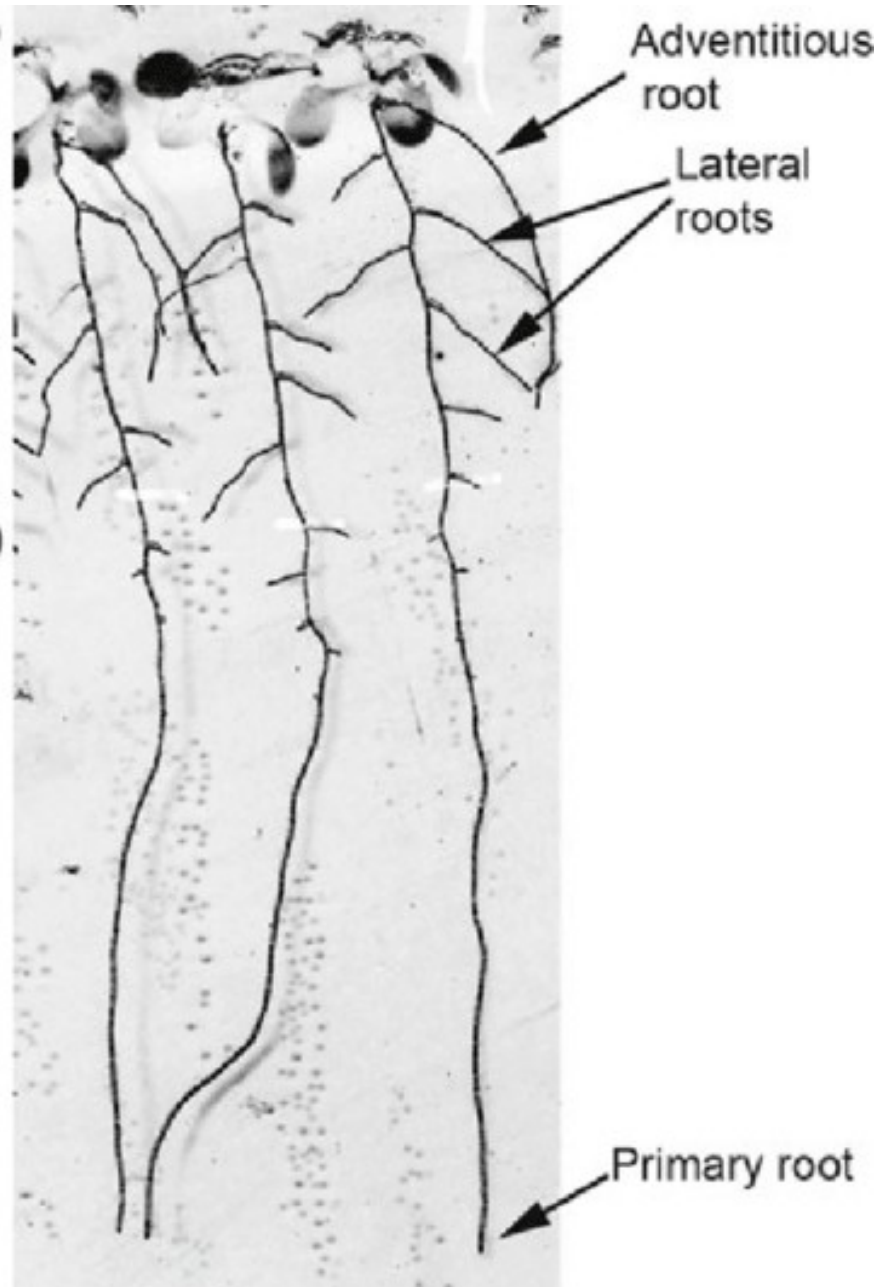


Figure 9.3: Root apical meristem

- a) Histogen Theory, b) Korper kappe theory,
 c) Quiescent Centre Concept

a

- Quiescent center
- Collumella initials
- Collumella
- Epi/LRC initials
- Lateral root cap (LRC)
- Epidermis
- Cor/End initials
- Cortex
- Endodermis
- Stele initials
- Pericycle
- Phloem
- Xylem
- Procambium

b



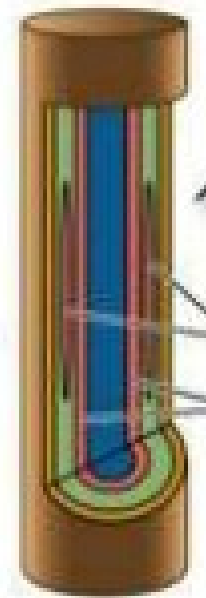
The apical bud contains a shoot apical meristem.



Axillary bud primordium

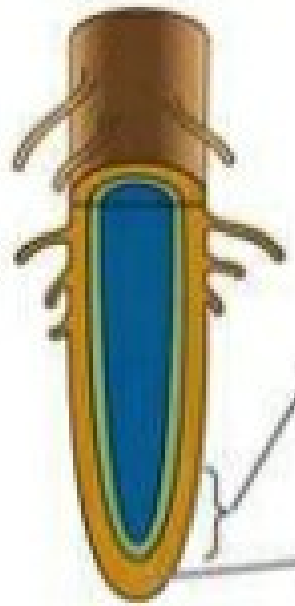
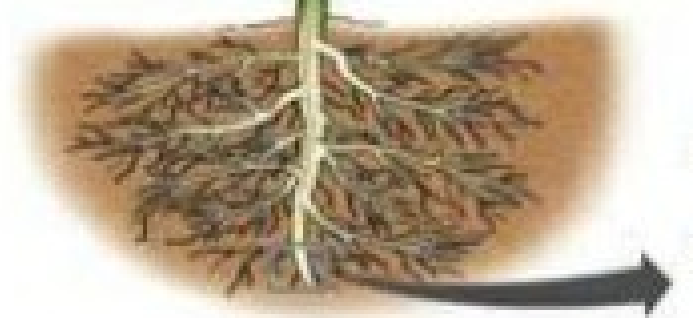
shoot apical meristem

In woody plants the vascular cambium and cork cambium thicken the stem and root.



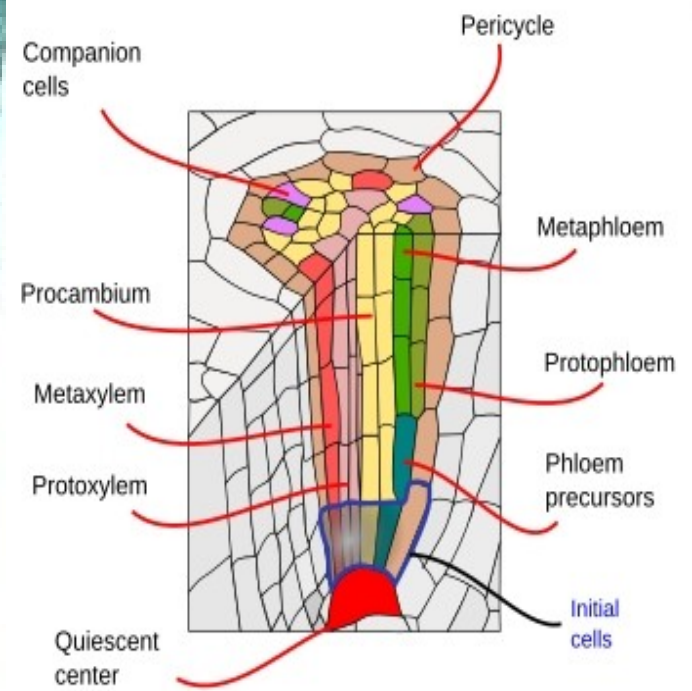
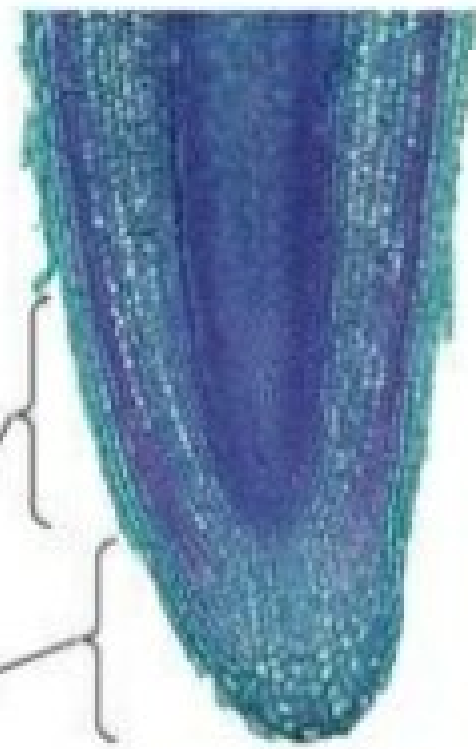
Lateral meristems:
Cork cambium
Vascular cambium

100 μm



Root apical meristem

Root cap



Types of Root Apex

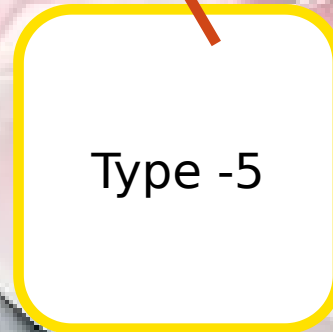
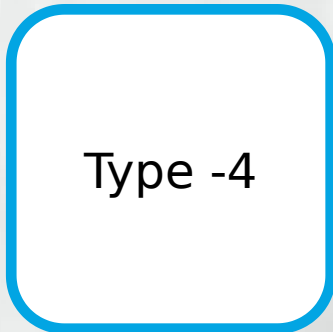
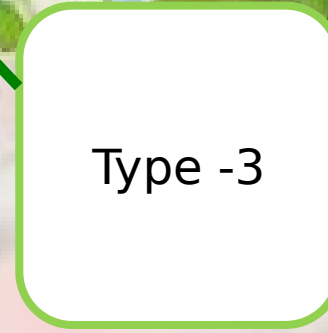
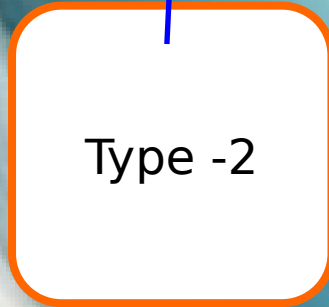
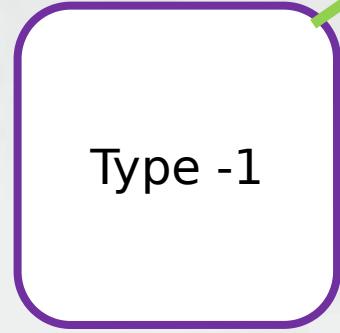
Type -1

Type -2

Type -3

Type -4

Type -5



Type 1 Apical cell , eg. **Pterideophyte**

Type 2 ... Apical intial cell all type of cell formed like Epidermis,cortex, vascular cylinder. eg. **Dicot**

Ranunculaceae,

eg. Monocot Allium

Type 3... Two layer of initial cell first outer cell is periblem and other one is plerome formed Epidermis,cortex, vascular cylinder are respectively. Eg. **Gymnosperms**

Type 4 ... Three layer of meristmetic cell Dermetogen , periblem ,plerome formed us Epidermis and root cap are **dermetocalyptrogen** , ground meristem , cortex, vascular cylinder are respectively. Eg. **All dicot plants root**

Type 5.. four layer of meristmetic cell 1st root cap cell (**Calyptragen**) , 2nd cell Dermetogen,(epidermis), 3rd cell periblem (Cortex) , 4th cell plerome (vascular cylinder) eg. **Zea maize Monocot**

Types of Root Apex

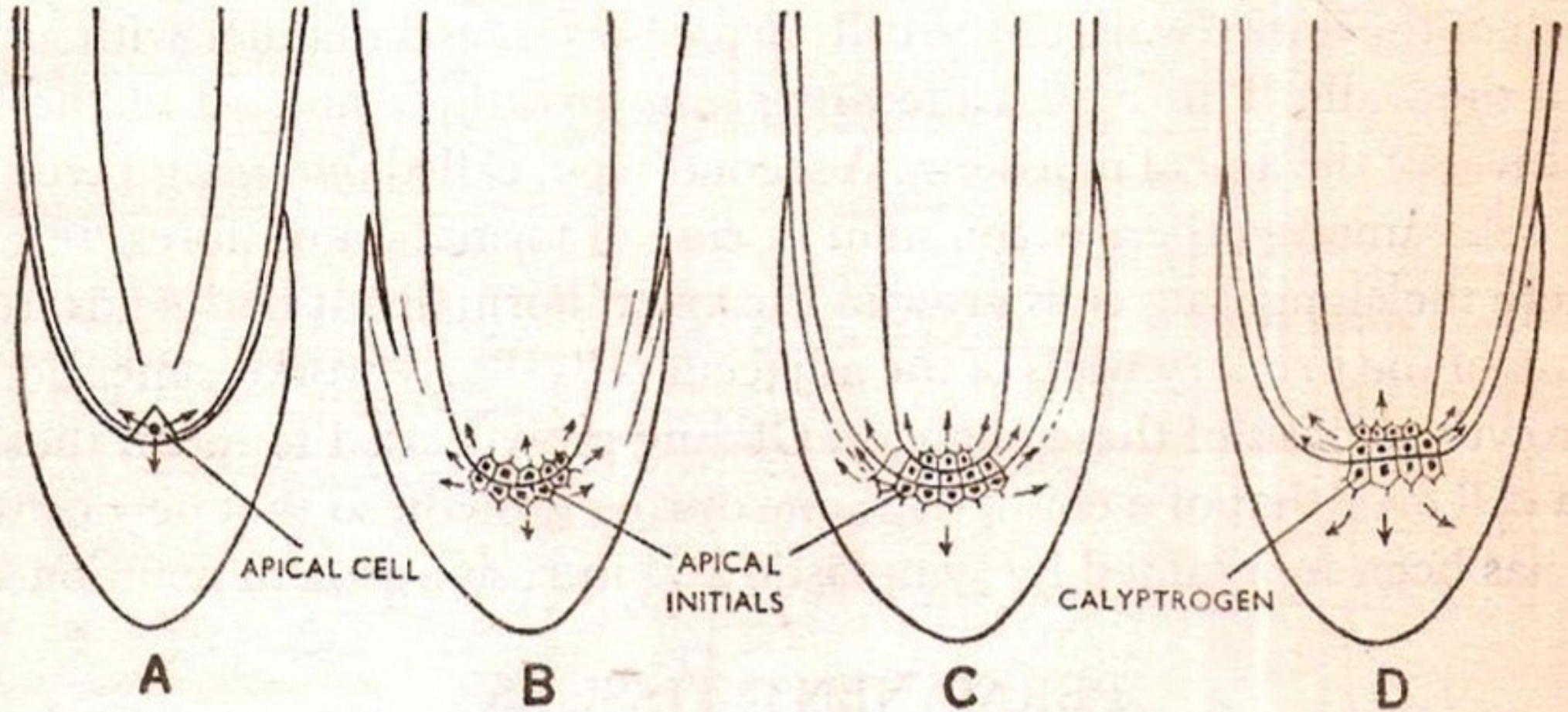


FIG. Root apices (diagrammatic)—A. Type found in pteridophytes with solitary apical cell. B. As found in gymnosperms. C. As found in dicotyledons. D. As found in monocotyledons.



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GOOD

THANK YOU
FOR
WATCHING

