

**THEORIES REGARDING THE  
ORGANISATION OF SHOOT  
APEX**

# **THEORIES REGARDING THE ORGANISATION OF SHOOT APEX**

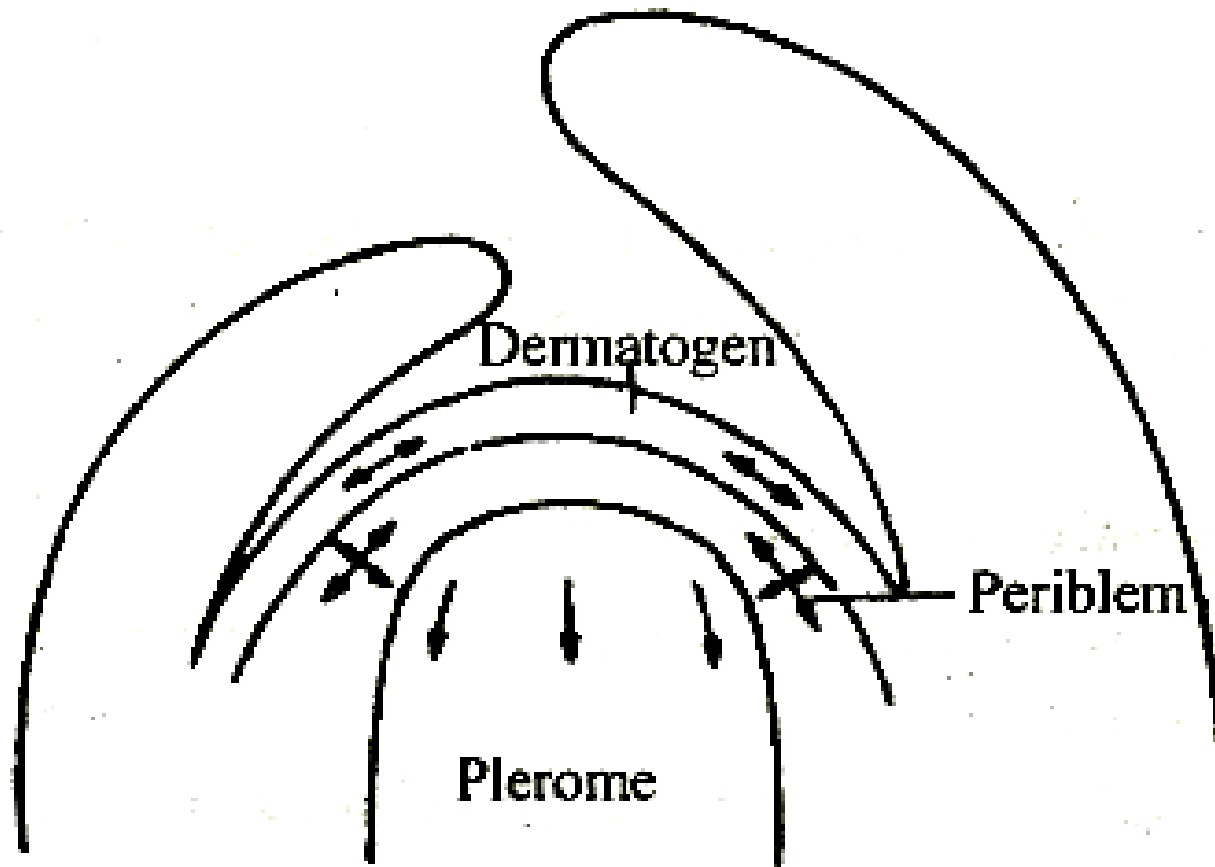
- **Apical Cell Theory**
- **Histogen theory**
- **Tunica-carpus theory**

# APICAL CELL THEORY

- ❖ This theory proposed by Karl Nageli and Hofmeister in 1958 and supported by Wolff.
- ❖ According to Nageli and Hofmeister, the apical meristem is composed of single apical cell and the entire plant is developing from this single apical cell.
- ❖ It is only applicable to Bryophytes and some Pteridophytes and some higher algae (Fucus, Dictyota & Sargassum)

# Histogen Theory

- ❖ It was proposed by Hanstein (1870).
- ❖ According to him, the root and shoot apices are distinguished into three meristematic regions or three layers of cells called histogens.
- ❖ They are :
  - a) Dermatogen giving rise to Epidermis
  - b) Periblem produces Cortex & endodermis
  - c) Plerome forms stele with vascular tissues and pith

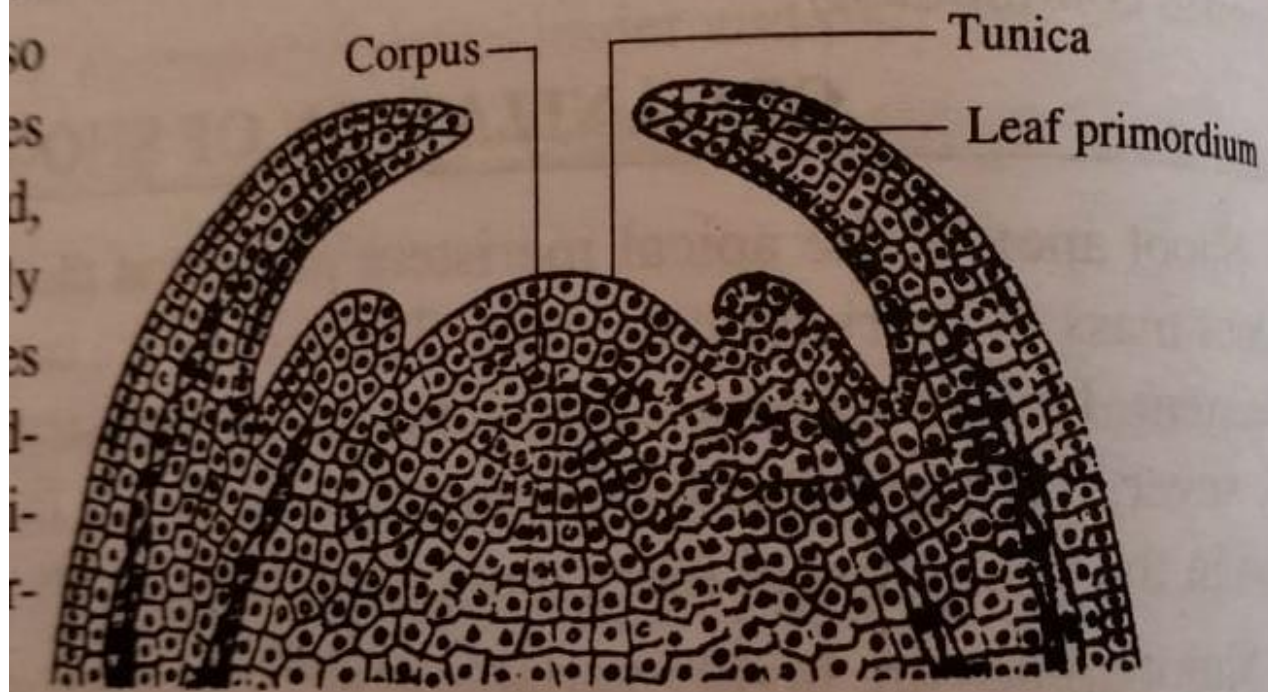


Organization of shoot apex  
proposed by Hanstein

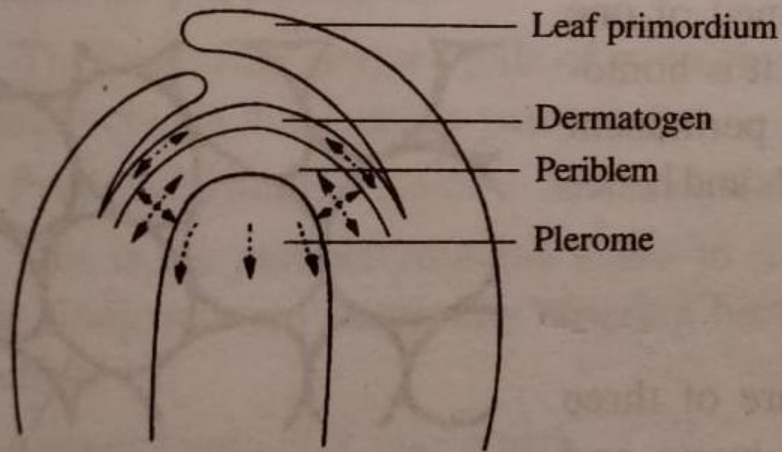
# Tunica-corporis Theory

- ❖ It was proposed by Schmidt (1924) to describe shoot apex.
- ❖ According to this theory the shoot apex can be differentiated into two regions of unlike structure and appearance
- ❖ There is a central core, the corpus with large cells dividing irregularly to result in volume growth
- ❖ It is surrounded by an outer enveloping layer the tunica
- ❖ Tunica cells are smaller and divide mainly anticlinally to epidermis and outer cortex.
- ❖ The corpus may be one to many layered and produces inner cortex, Procambium and pith.

consist of...  
ds and envelops the central corpus. Tunica cells are



**Shoot apex according to tunica- corpus theory**

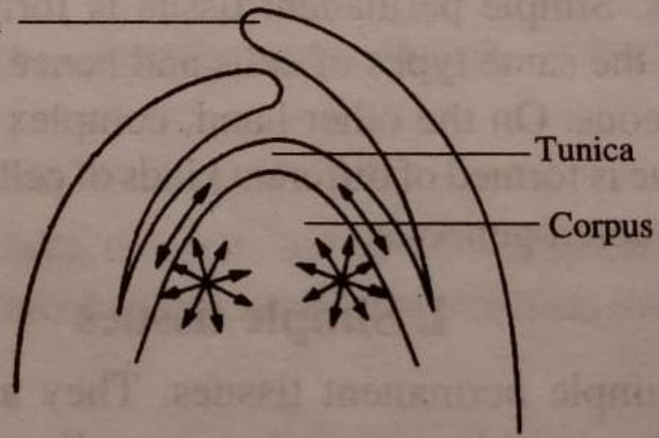


Leaf primordium

Dermatogen

Periblem

Plerome



Tunica

Corpus

**Organization of shoot apex  
according to histogen concept**

**Organization of shoot apex  
according to tunica-corpora concept**