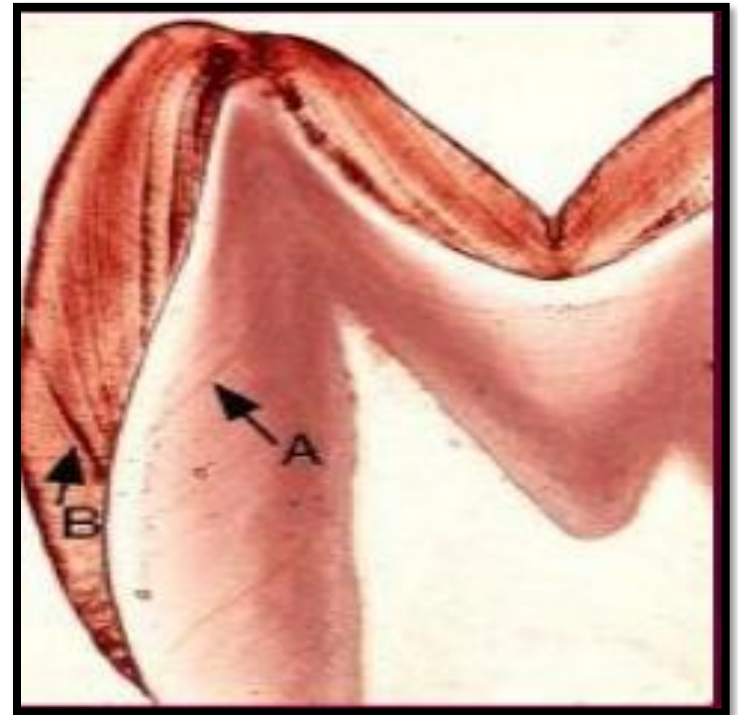
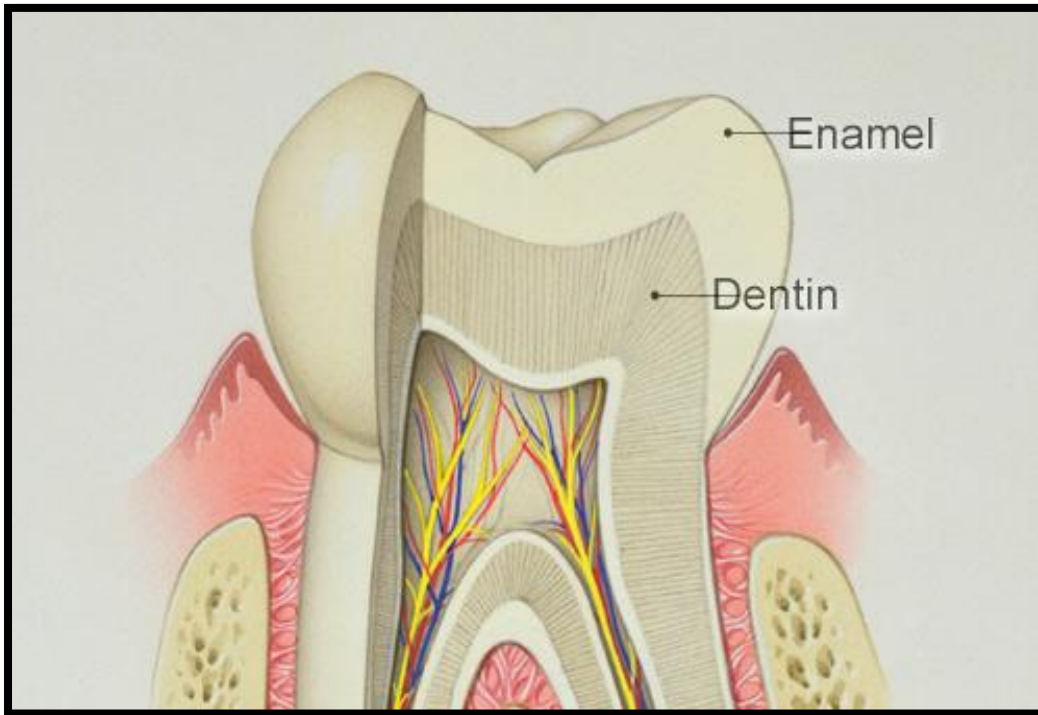


ENAMEL

PART-1 and 2



DR. SAJDA KHAN GAJDHAR
COURSE CO-ORDINATOR
ORA CAVITY IN HEALTH

LECTURE LEARNING OUTCOMES

Dental Enamel-2

LLO	By the end of this Lecture , students should be able to:
------------	--

- | | |
|-----------|---|
| 1. | Discuss Cross striation, incremental lines, and Neonatal lines. |
| 2. | Discuss Enamel tuft, lamellae and DEJ |
| 3. | Describe surface structure of enamel |

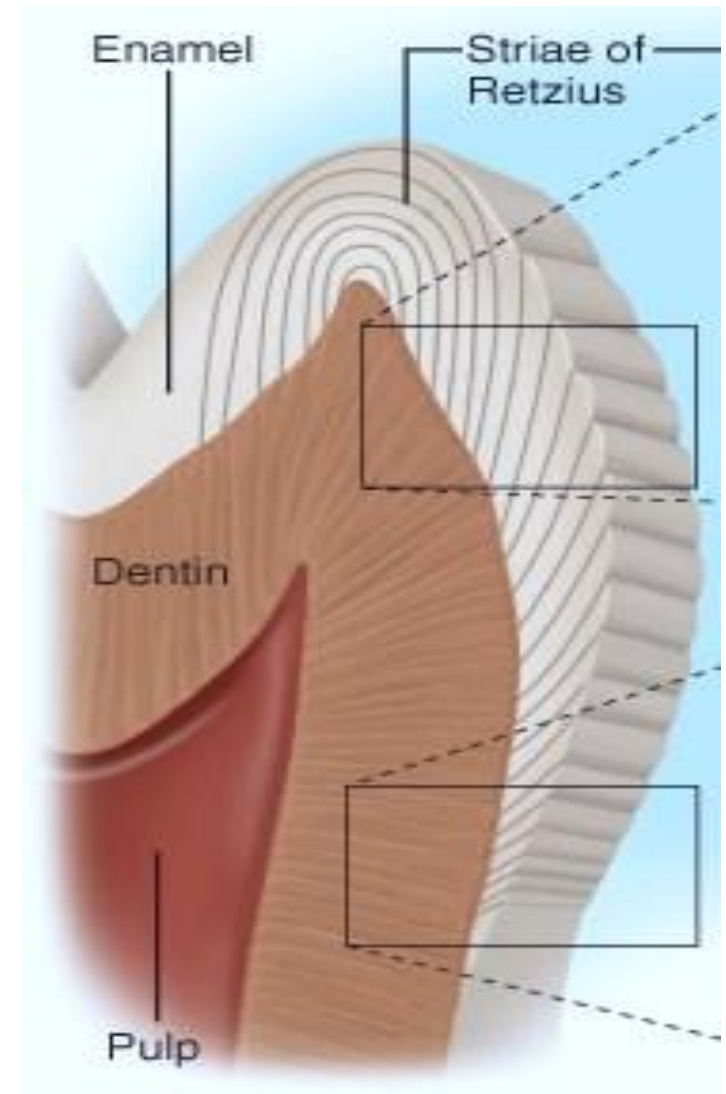
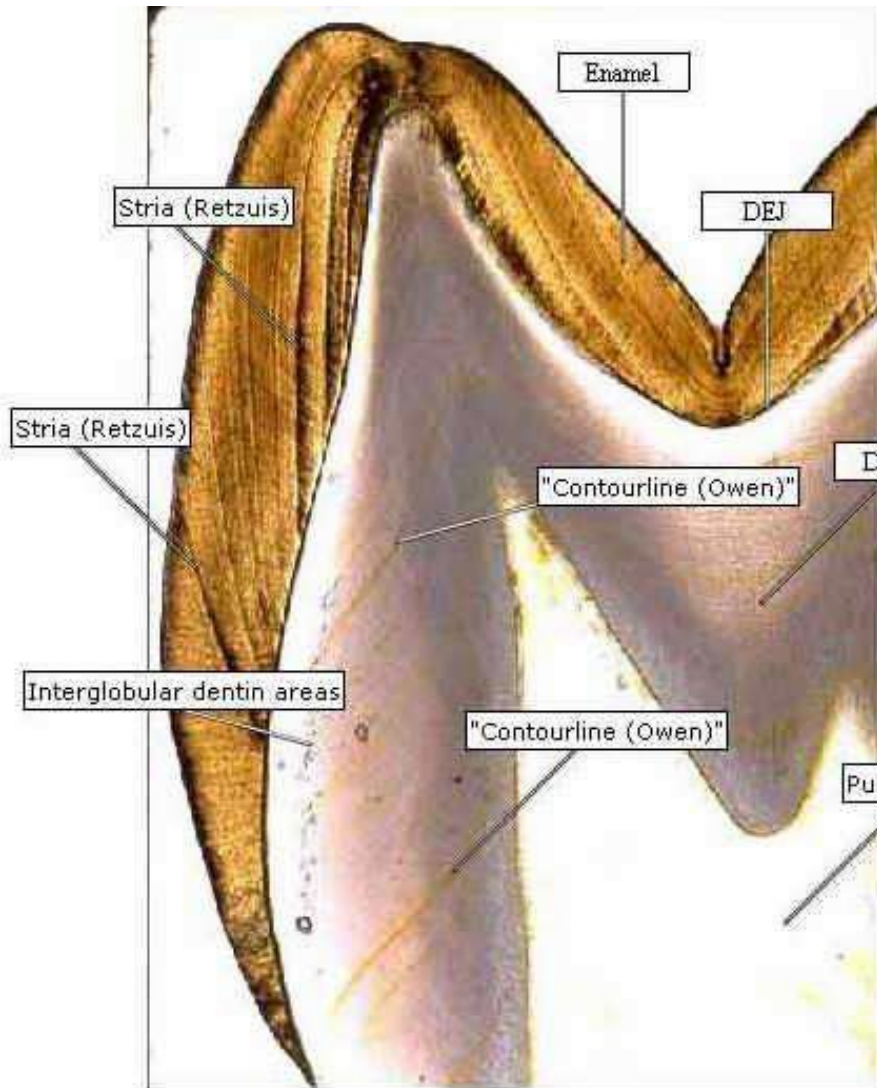
Essential reading:

- Tencate's Oral histology ; pages 122 - 164
- James Avery textbook; 97-108

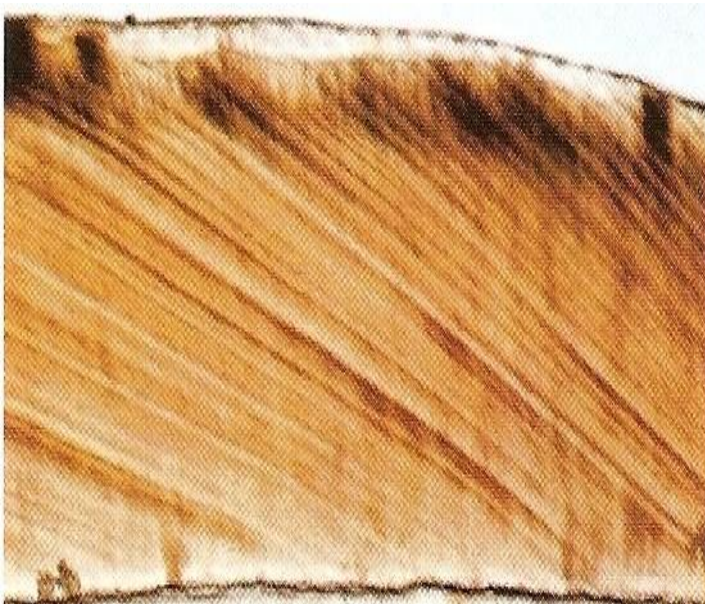
Hypocalcified structures of Enamel

1. Rod sheaths
2. Striations
3. Dentinoenamel junction
4. Incremental lines of Retzius
5. Neonatal line
6. Enamel lamellae
7. Enamel tufts
8. Enamel spindles

INCREMENTAL LINES OF RETZIUS

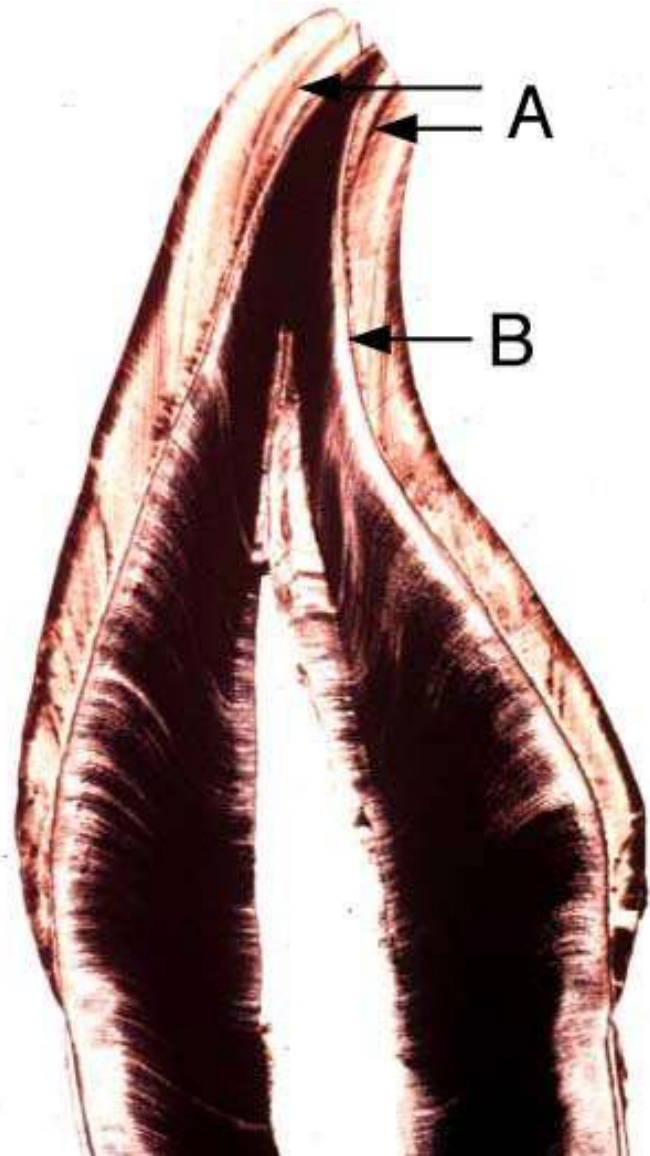


- ✓ **Brownish band** seen in ground section of enamel that illustrate successive deposition of layers of enamel during formation of crown.
- ✓ In longitudinal section , they are seen as a series of oblique lines extending from the dentino-enamel junction towards the tooth surface.
- ✓ **In cross section** , they appear as **concentric rings**.

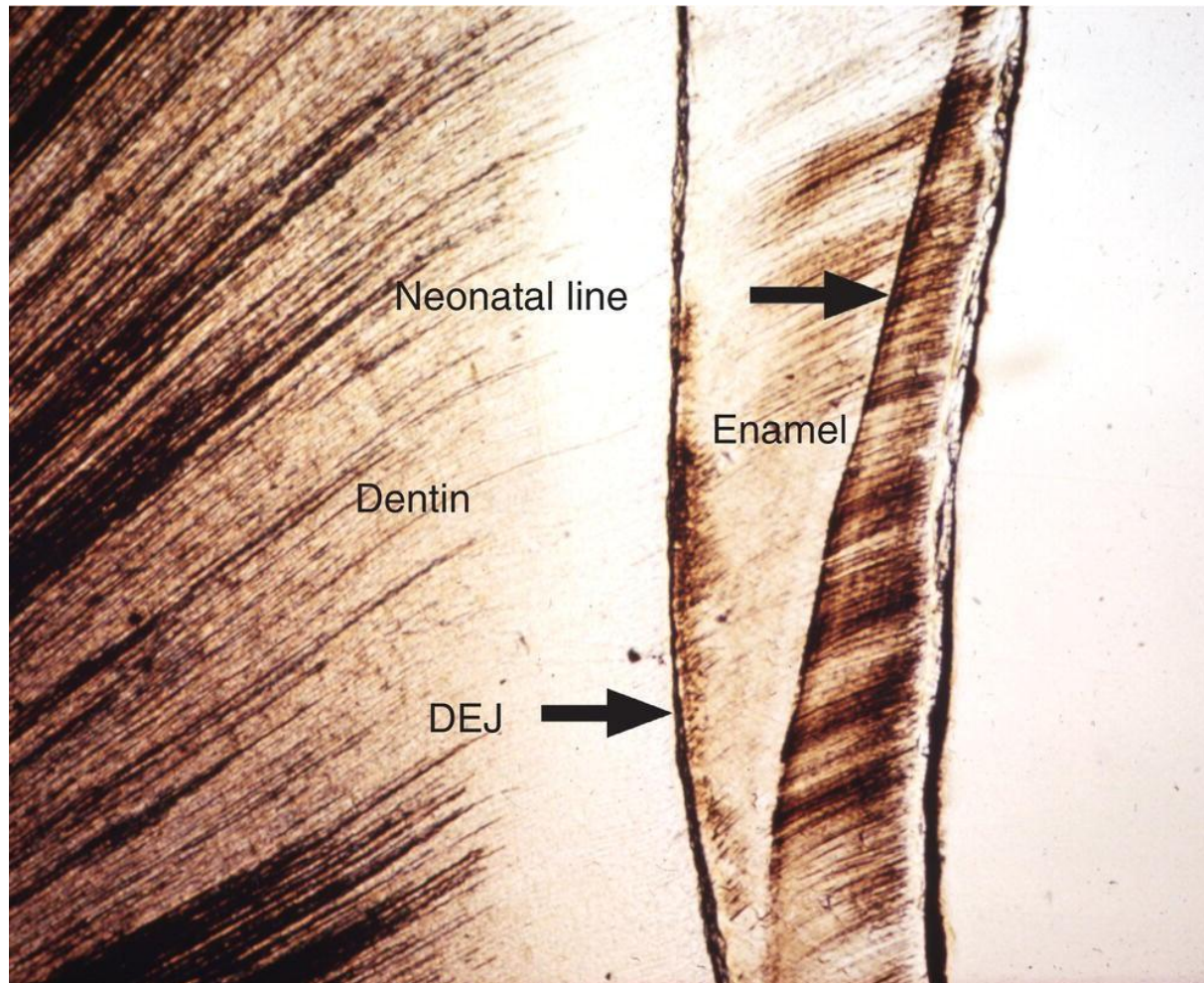


Significance:

- Broadening of Incremental lines may reflect metabolic disturbance at the time of matrix formation.

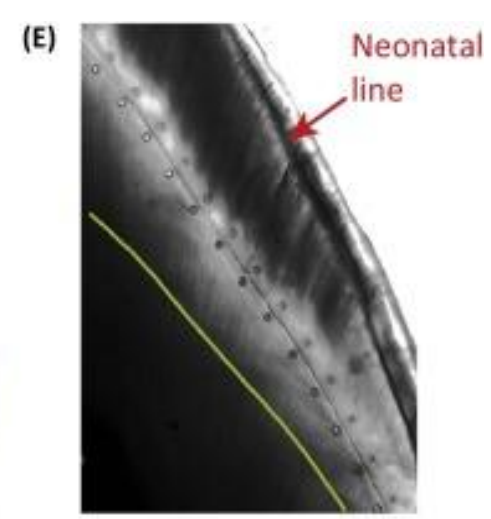
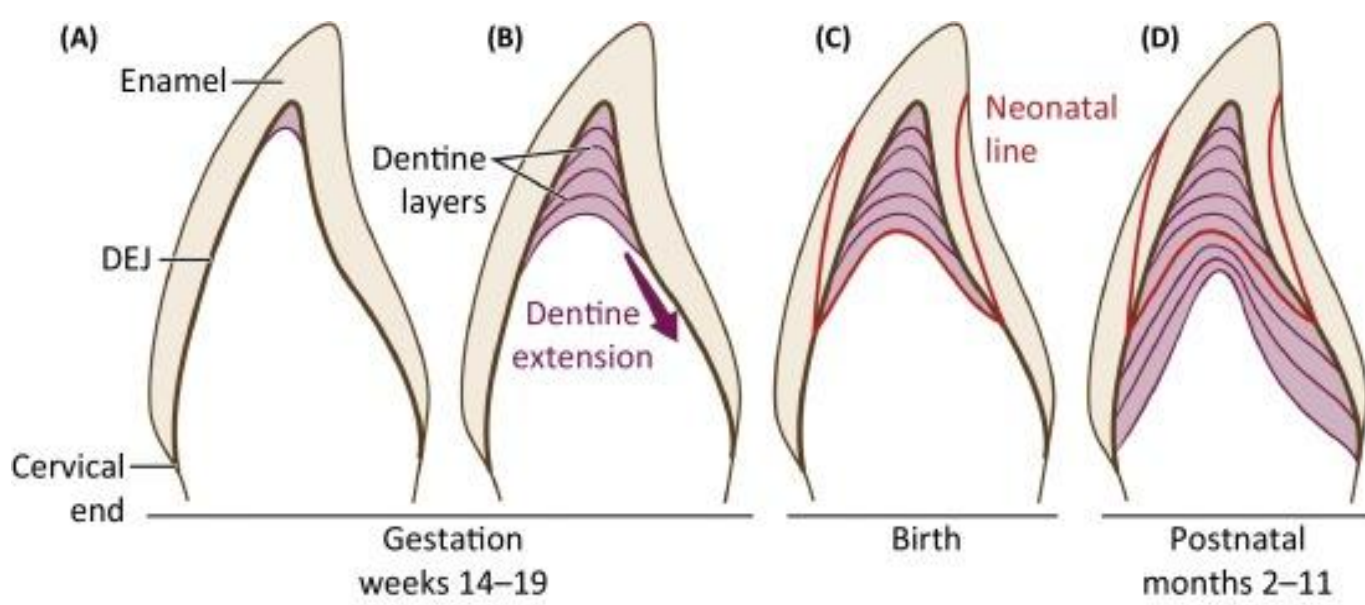
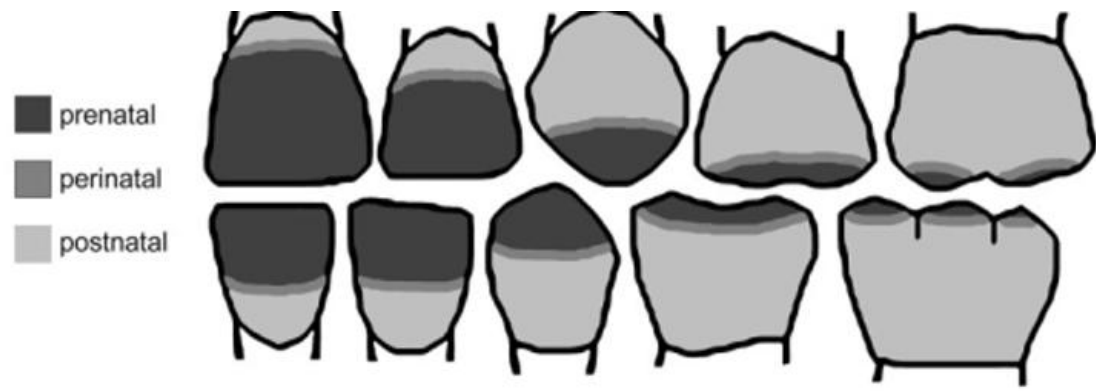
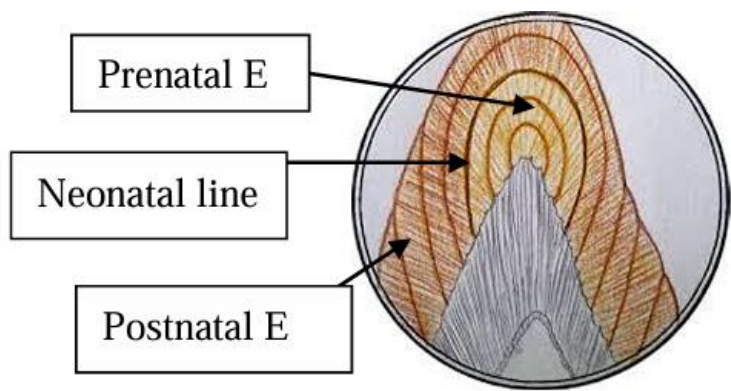


NEONATAL LINE

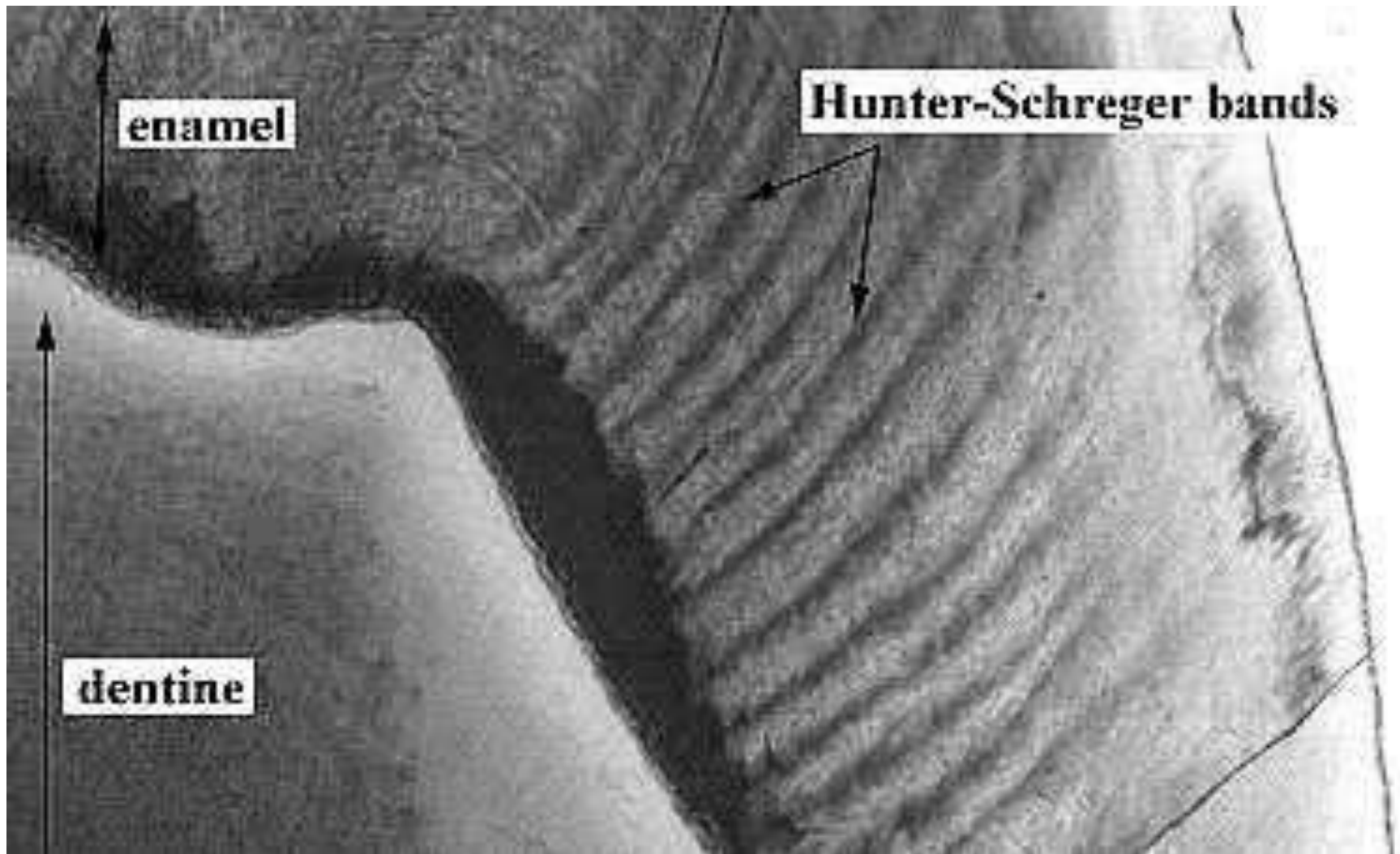


NEONATAL LINE

- The enamel of the deciduous teeth develops partly before & partly after birth. The boundary between the 2 portions of enamel in the deciduous teeth is marked by an accentuated Incremental line of Retzius, the *Neonatal line/ring*.
- Results from abrupt change in the environment & nutrition of newborn infant.
- Prenatal enamel is usually better developed than postnatal enamel as fetus develops in well protected environment with an adequate supply of all essential materials.



HUNTER SCHREGER BANDS



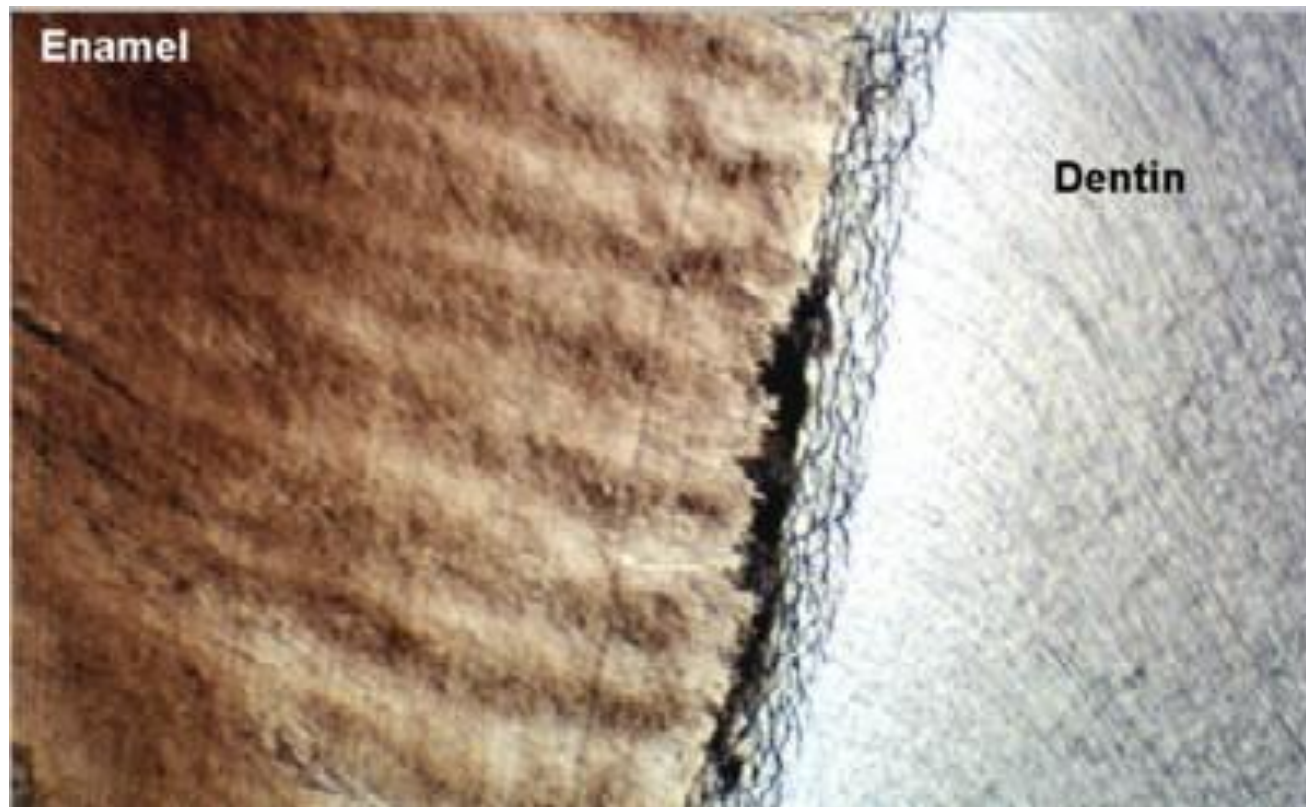
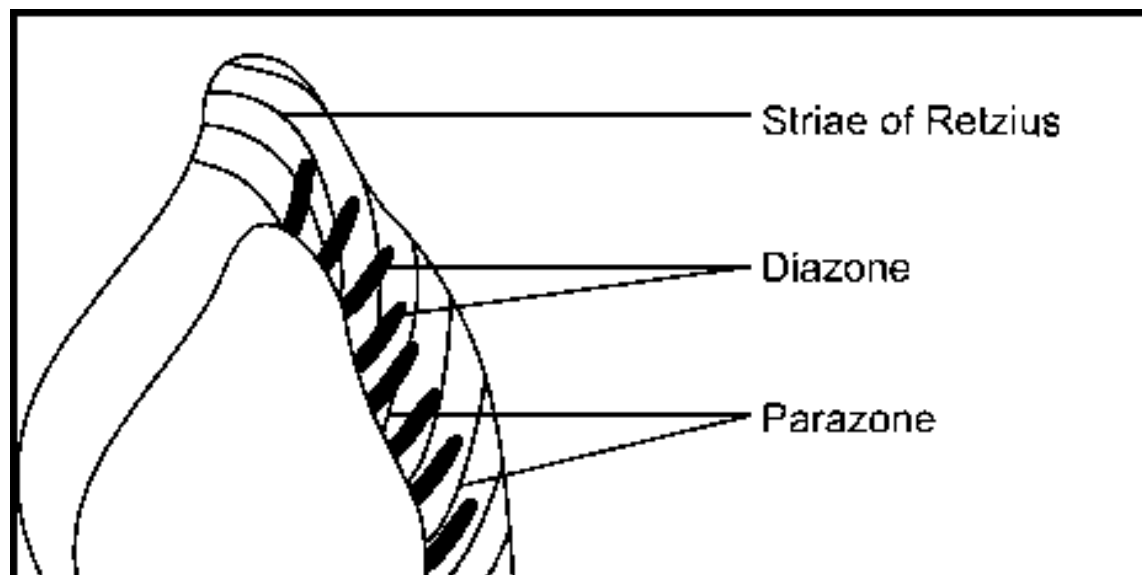
- The regular change in the direction of rods is responsible for the appearance of alternating dark and light strips of varying width which are called as

Hunter Schreger bands.

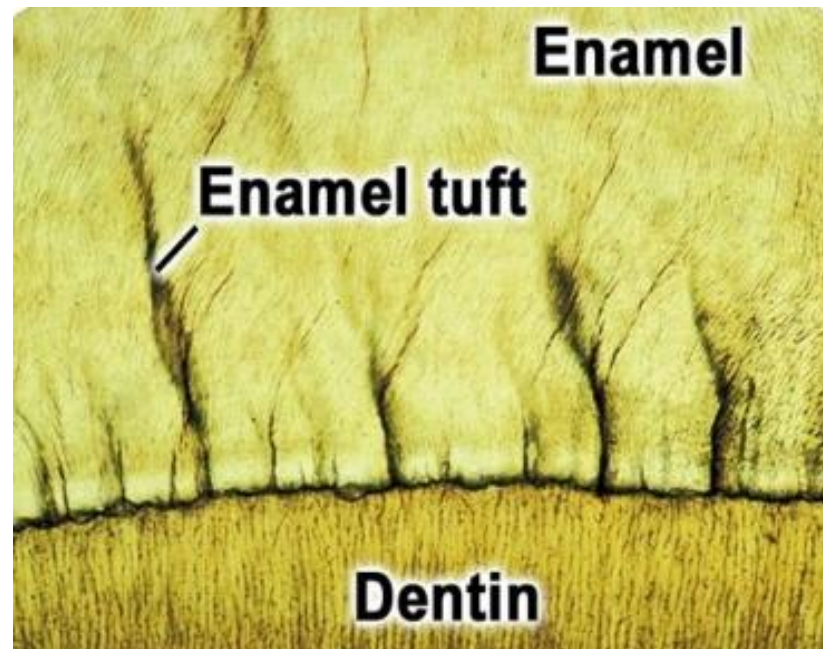
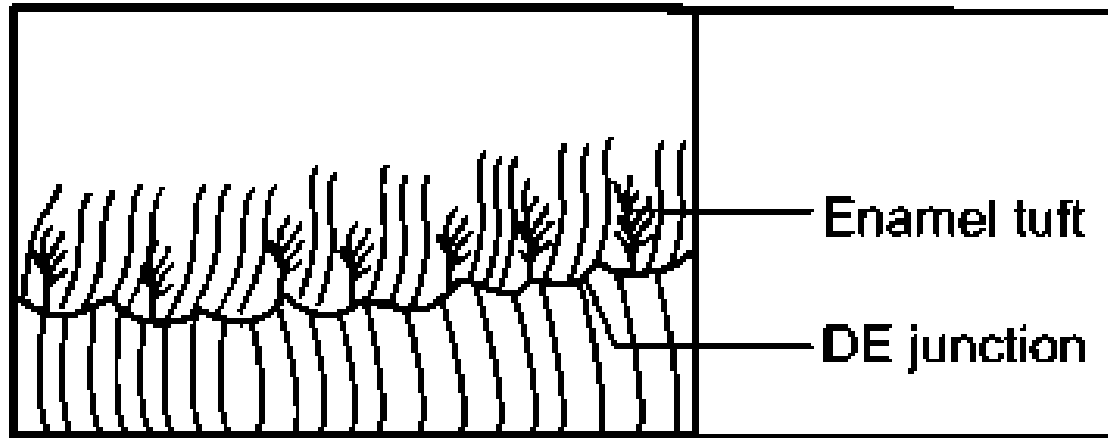
- Can be seen in longitudinal GS under oblique reflected light.

- HS bands originate at DEJ & pass outwards ending in some distance from outer enamel surface.

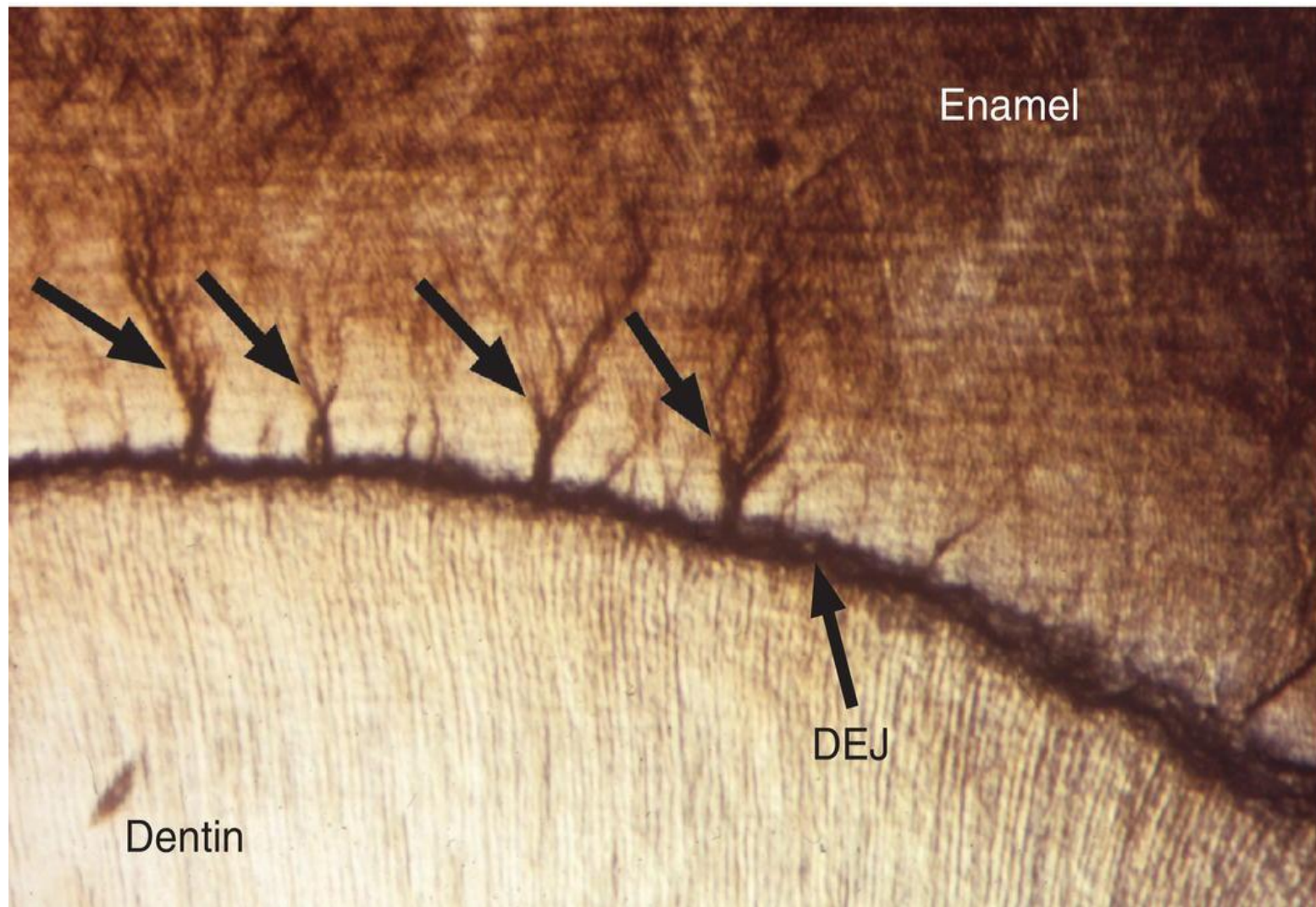




ENAMEL TUFTS

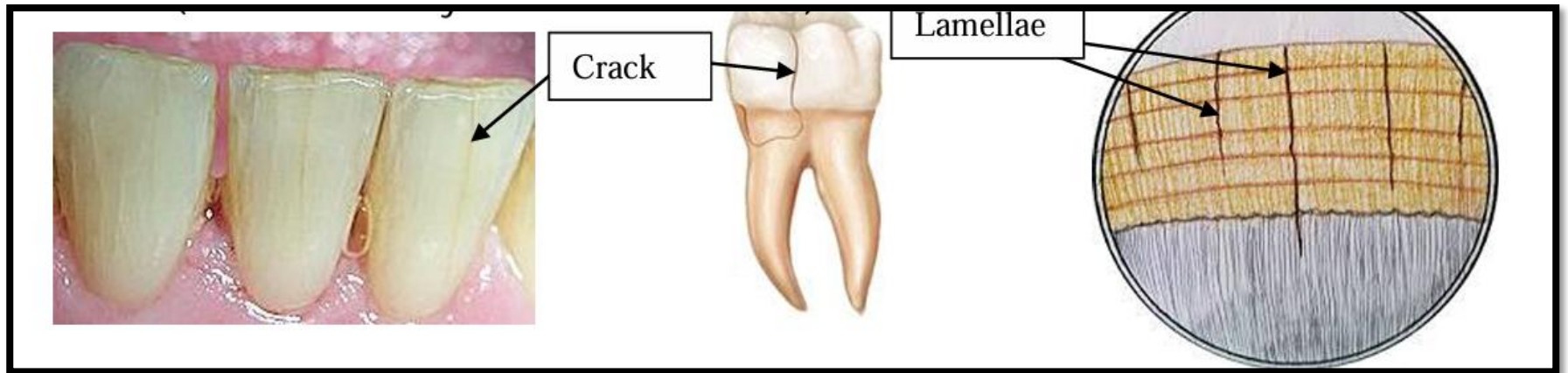


- ❑ They appear to be branched and contain greater concentrations of enamel proteins than the rest of the enamel (Hypocalcified).
- ❑ Due to abrupt changes in the direction of group of rods that arise from different regions of scalloped dentinoenamel junction
- ❑ Significance: Enamel Tufts prevents enamel fracture

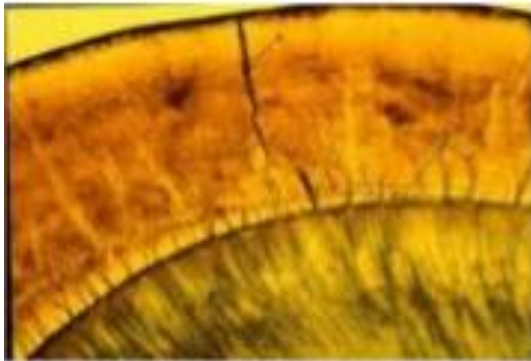


ENAMEL LAMELLAE

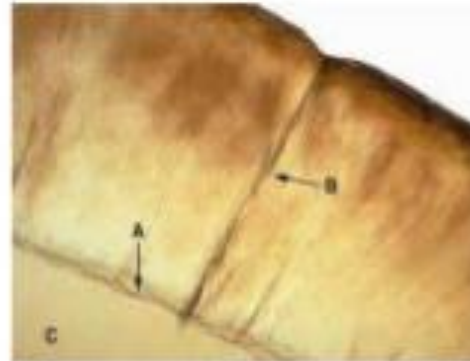
- 1) Thin organic layer develops in planes of tension
- 2) Extend from enamel surface toward DEJ
- 3) Sometimes penetrate Dentin.
- 4) It can be the beginning of larger tooth defects



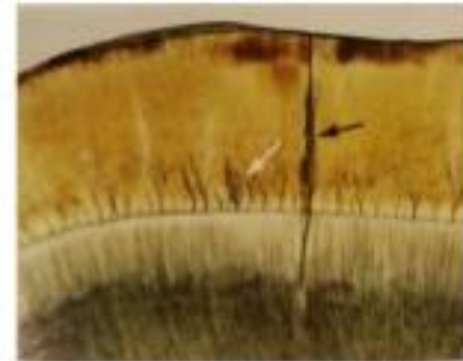
Type A



Type B



Type C



	Type A	Type B	Type C
Consistency	Poorly calcified rod seg.	Degenerated cells	Organic matter from saliva
Tooth	Unerupted	Unerupted	Erupted
Location	Restricted to the E.	Reach into the D.	Reach into the D.
Occurrence	Less common	Less common	More common

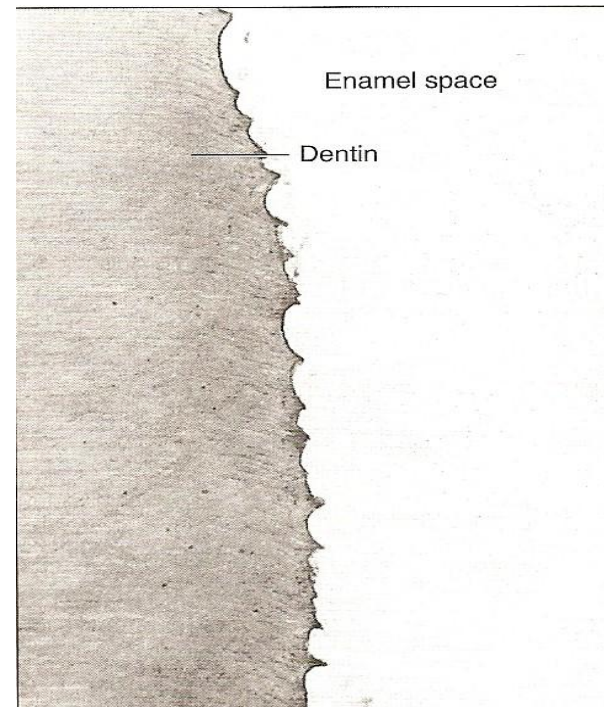
Significance

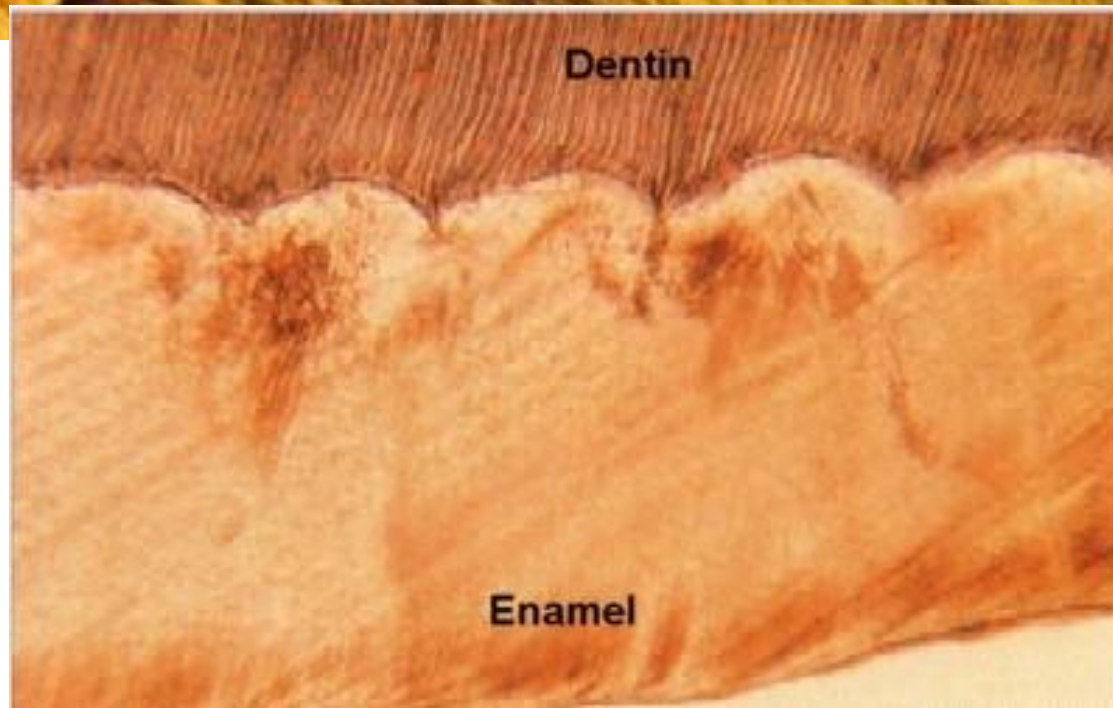
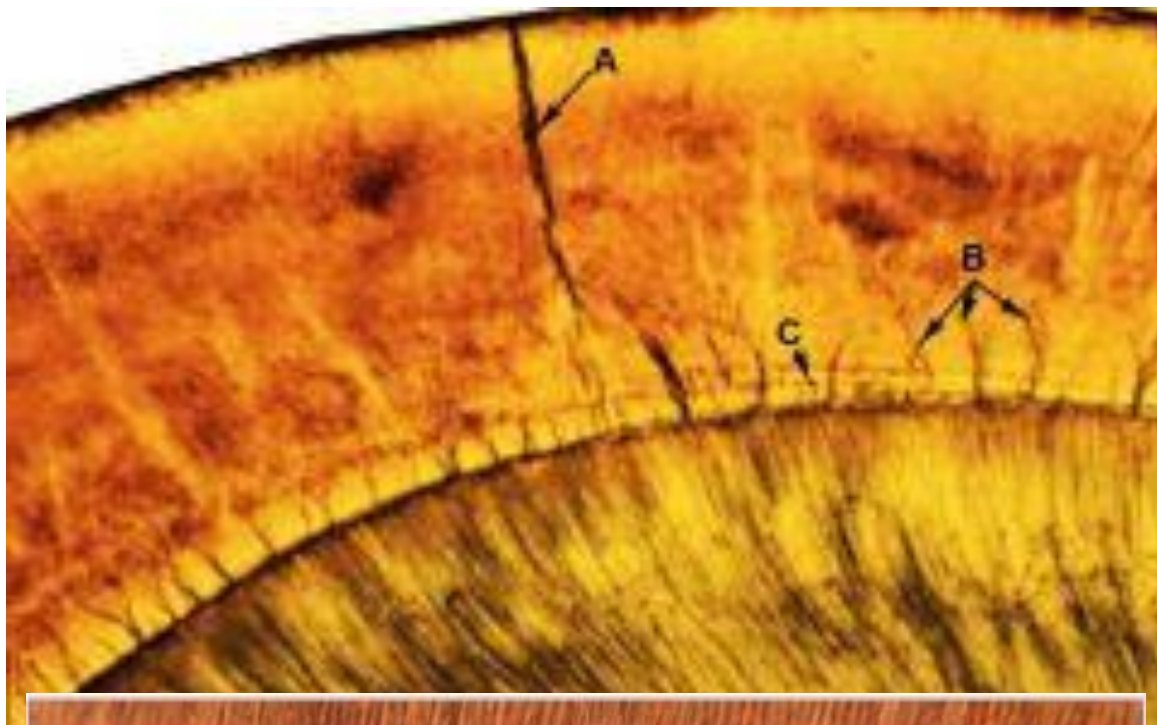
Road of entry for bacteria leading to
caries

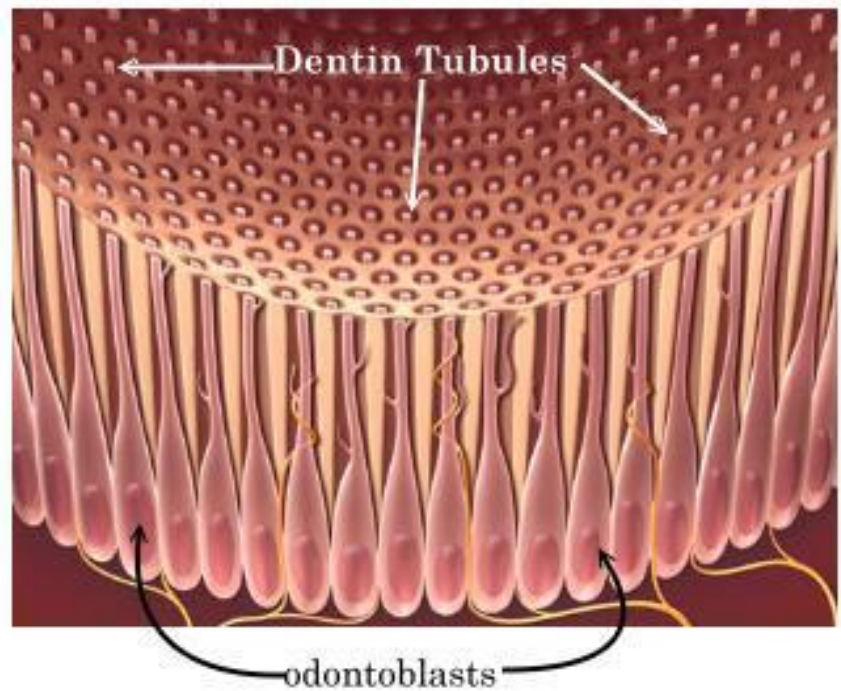
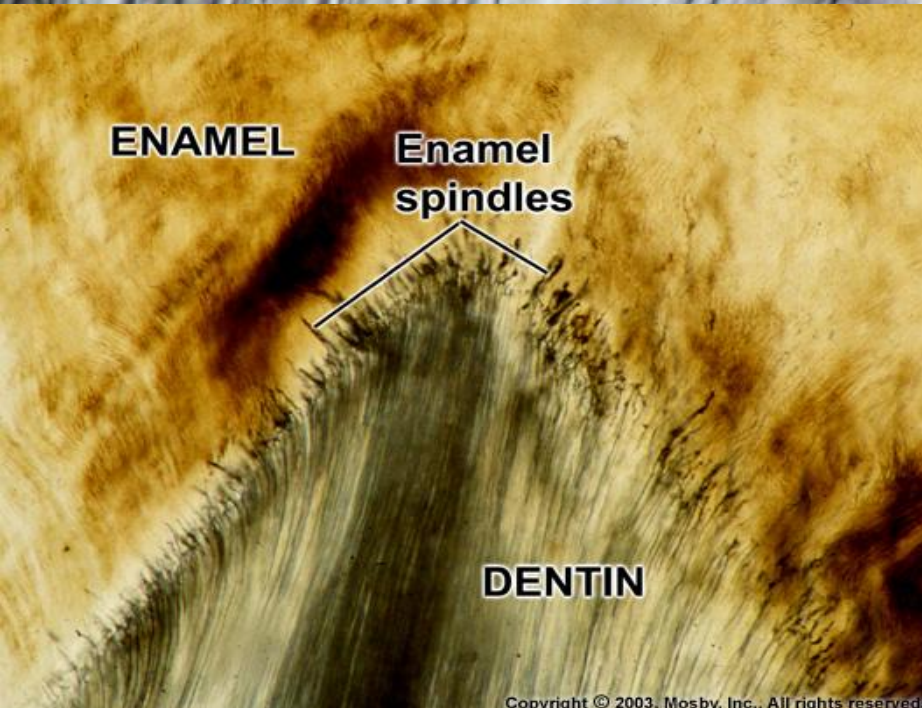
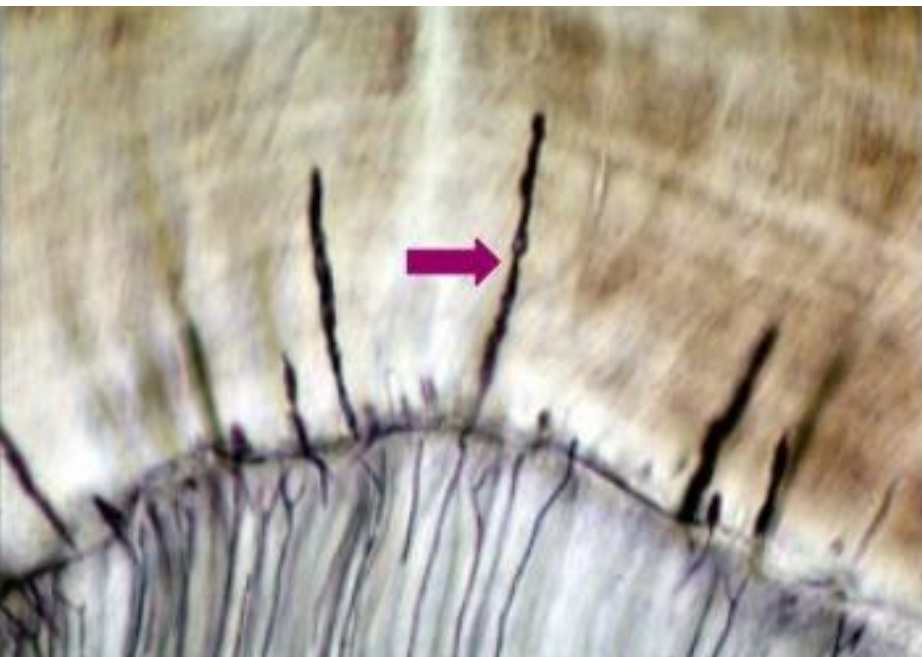
DENTINOENAMEL JUNCTION AND ENAMEL SPINDLES

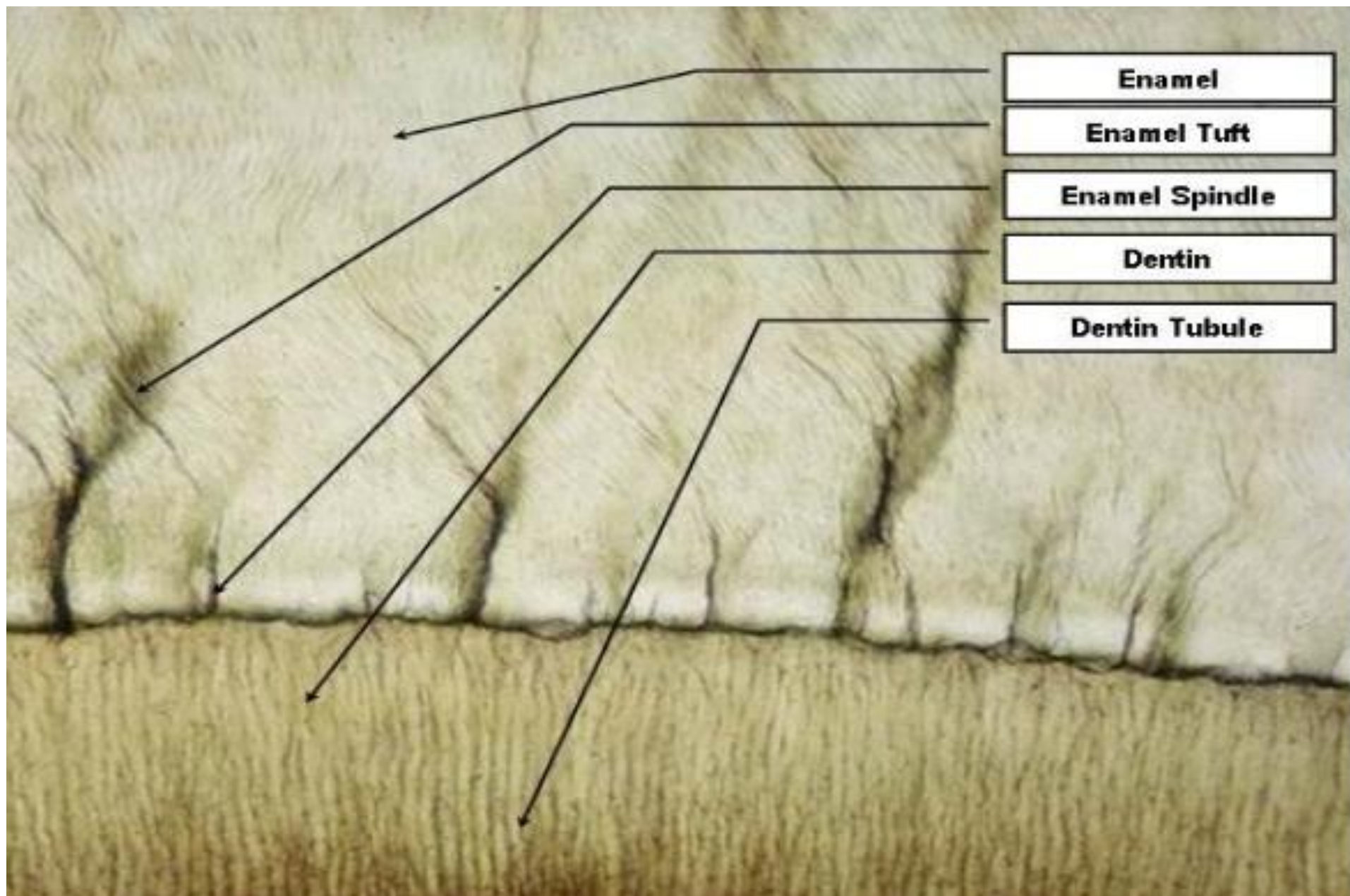
- DEJ: Scalloped in shape
- Shallow depression of dentin fit rounded projection of enamel

Significance :
It ensure firm hold of enamel
to dentin





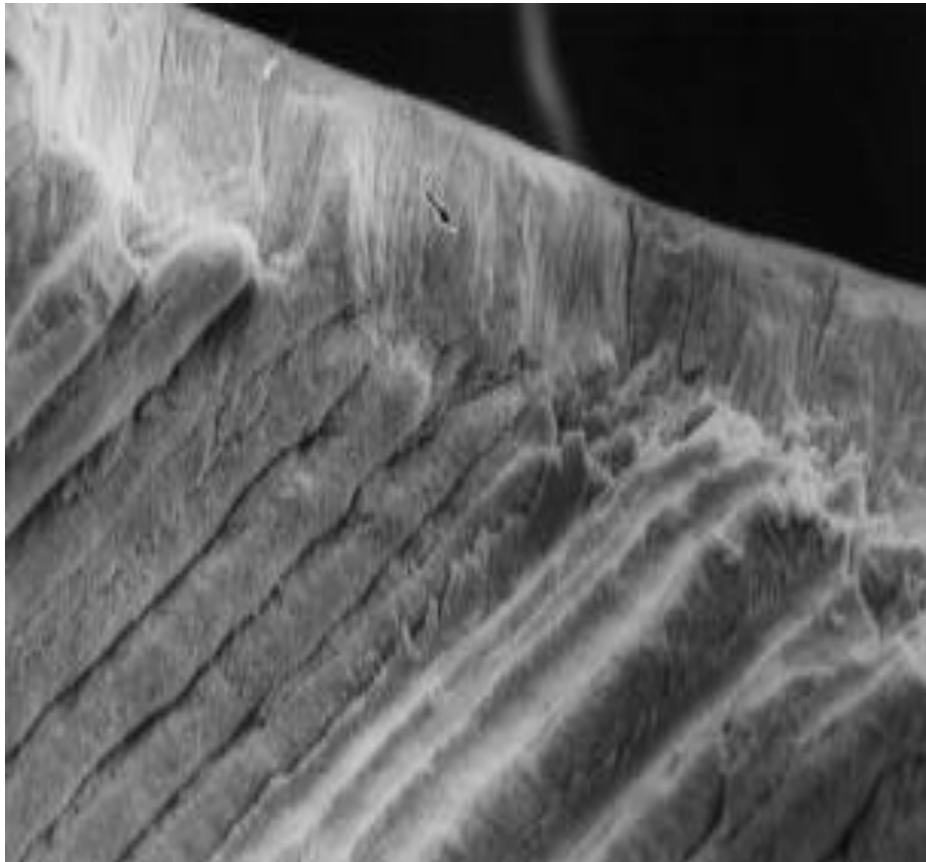




SURFACE STRUCTURES

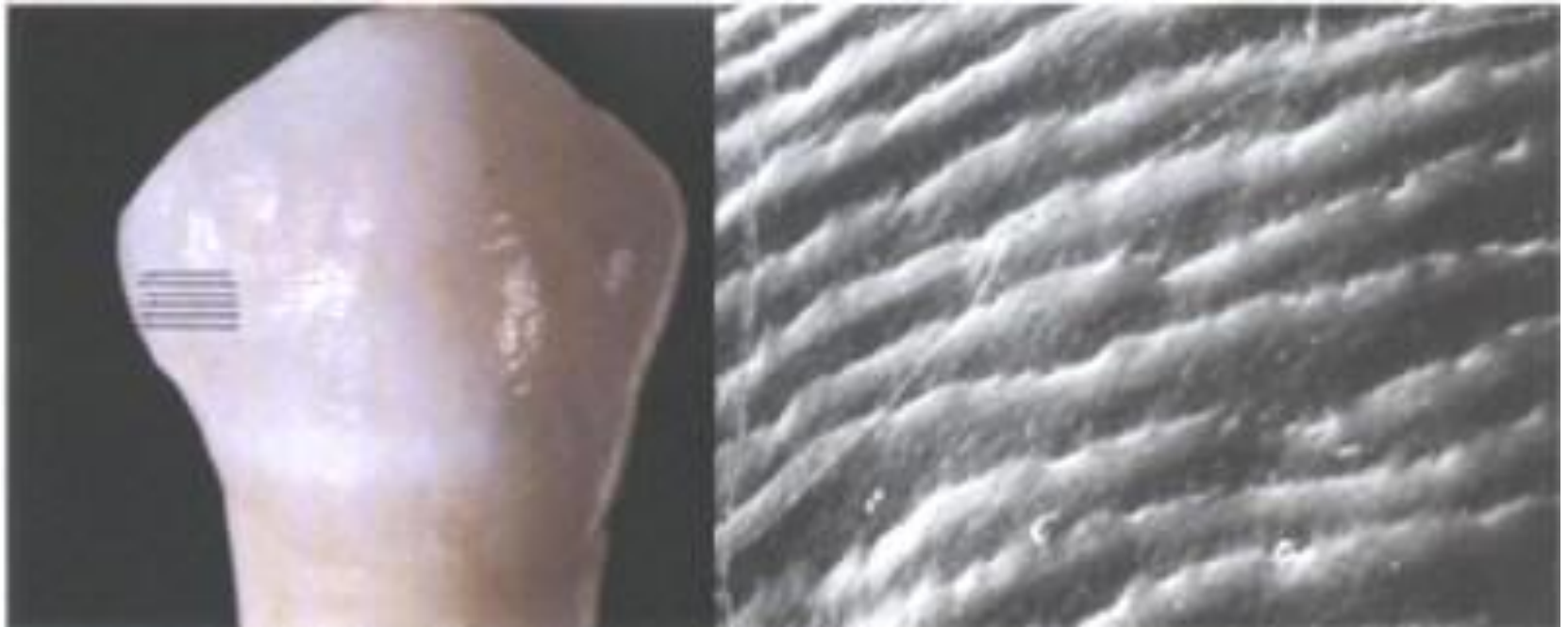
- **Prismless enamel**
- **Perikymata**
- **Enamel rod ends**
- **Cracks**
- **Enamel cuticle**

Prismless (structureless) layer – 20-40 μm thick (only with crystals)



- Enamel surface contains only crystals arranged almost at right angles to the surface.
- it is highly mineralized “hyper-mineralized”

PERIKYMATA (IMBRICATION LINES)

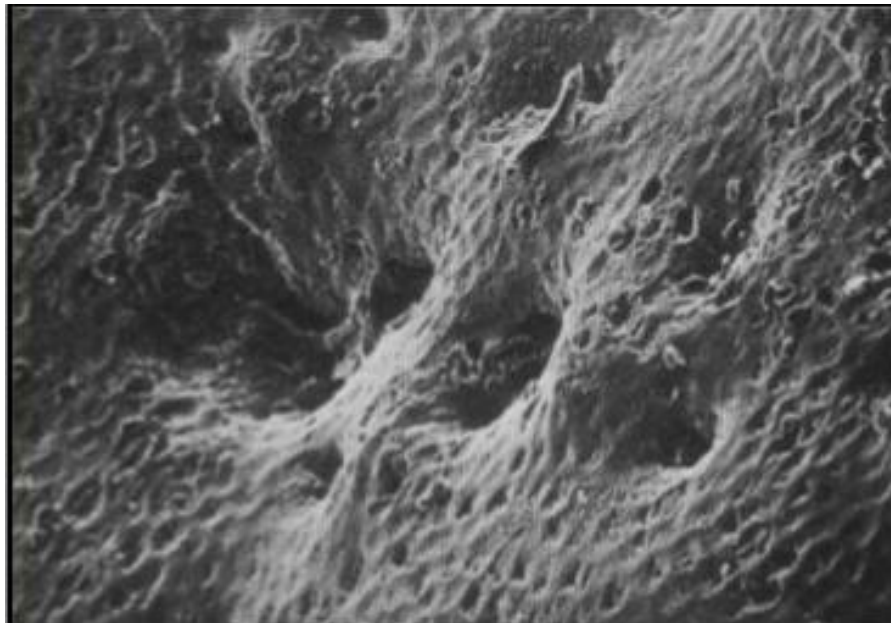


The external manifestation of the incremental lines of Retzius represented as transverse wave like grooves on the surface of the enamel are known as Perikymata.



Enamel Rod Ends

- They are concave depression vary in depth and shape.
- They are shallow at the cervical region and deepen near the incisal or occlusal surface.



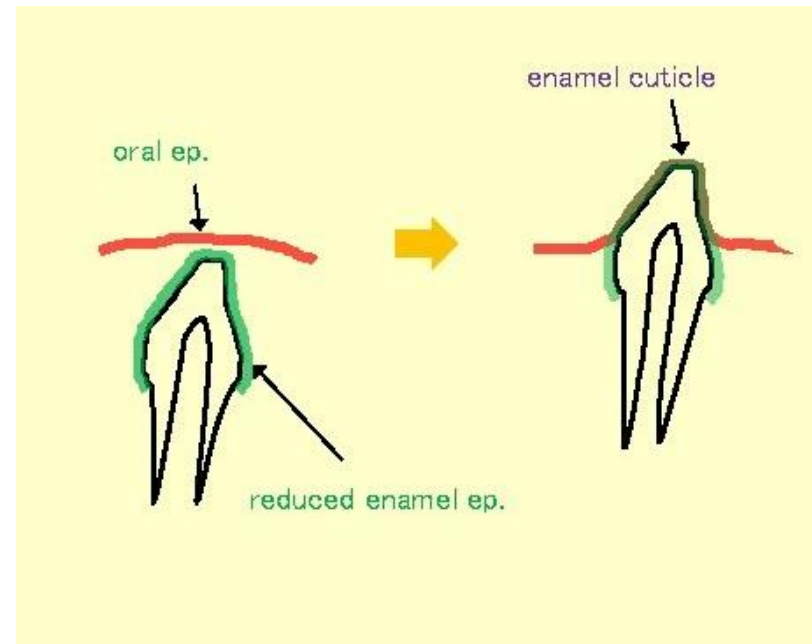
CRACKS

- They are narrow fissure like structure found on almost all enamel surfaces and extend for varying distance.
- They are actually the outer edge of enamel lamellae.



ENAMEL CUTICLE

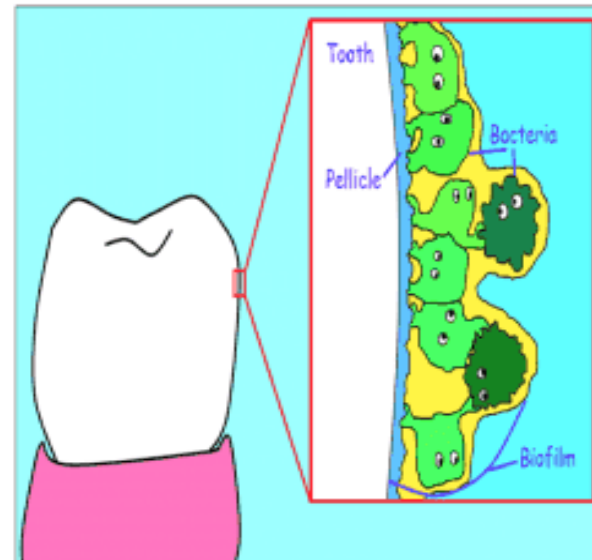
- Delicate membrane covers the crown of newly erupted tooth called Nasmyth's membrane.
- This is soon removed by mastication.



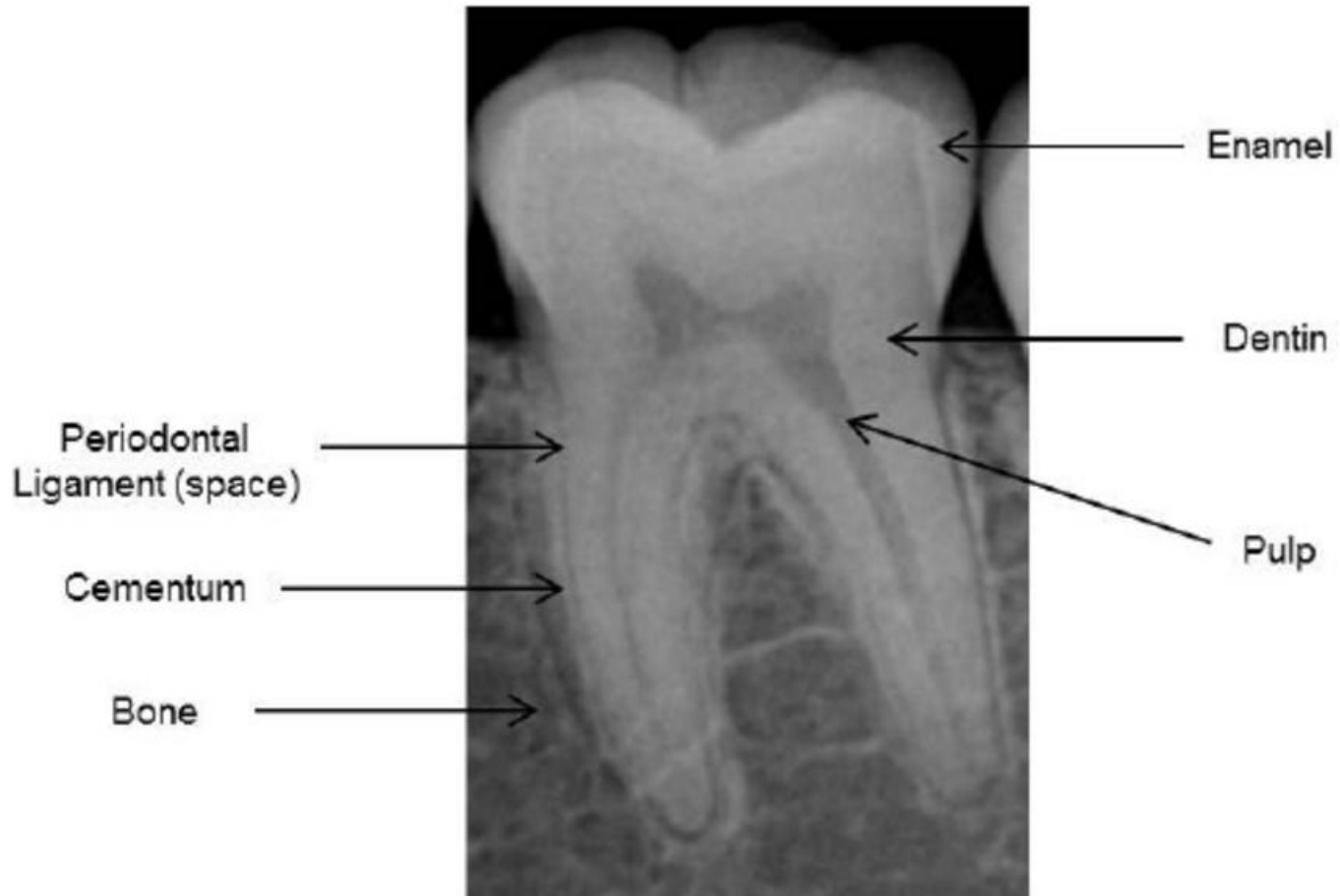
Enamel Pellicle

- Erupted enamel is covered by a precipitate of salivary protein.
- It reforms within hours after removal.
- It can provide a site for accumulation of microorganisms which later form dental plaque.

Pellicle and Dental Plaque



ENAMEL APPEARS MORE RADIOPAQUE THAN OTHER TISSUES





Age Changes of Enamel

- The most apparent age change in enamel is **attrition or wear of the occlusal surfaces and proximal contact points** as a result of mastication.
- This is evidenced by a loss of vertical dimension of the crown and flattening of the proximal contour.
- As a result of age changes in the organic portion of enamel , the teeth **become darker, and their resistance to decay may be increased, fluid permeability of older teeth is reduced.**



a



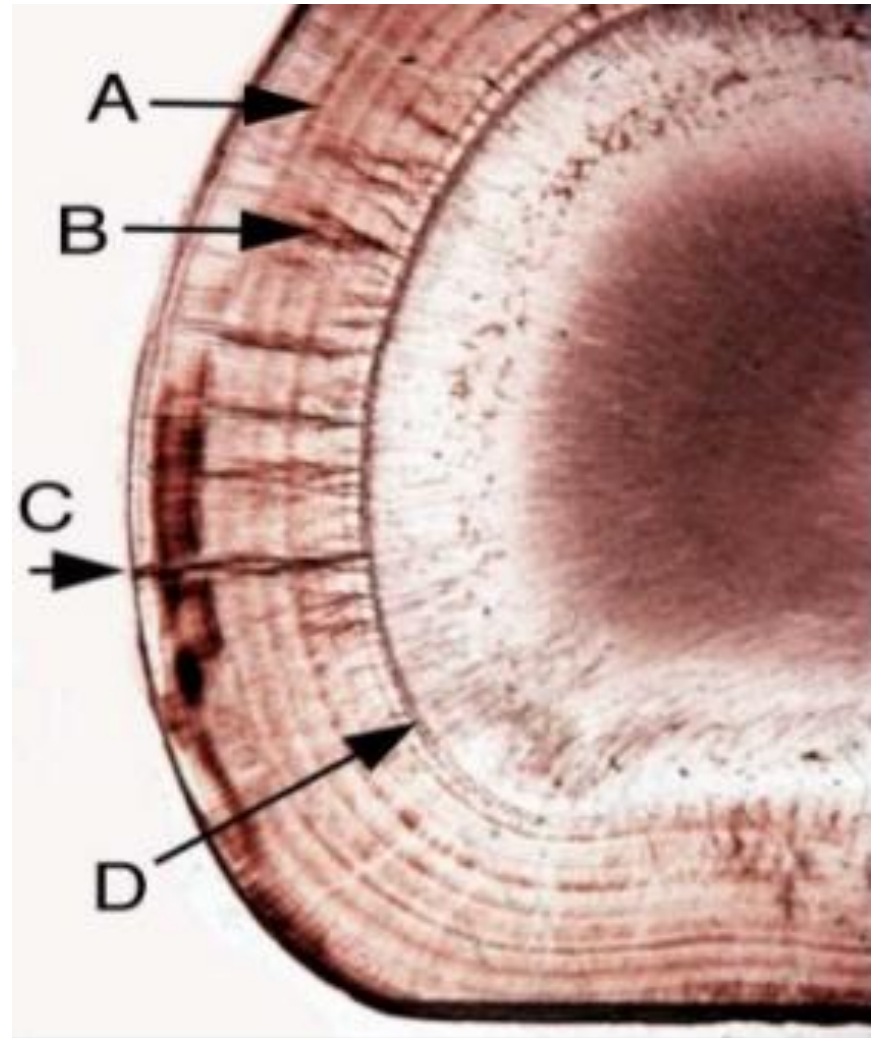
b

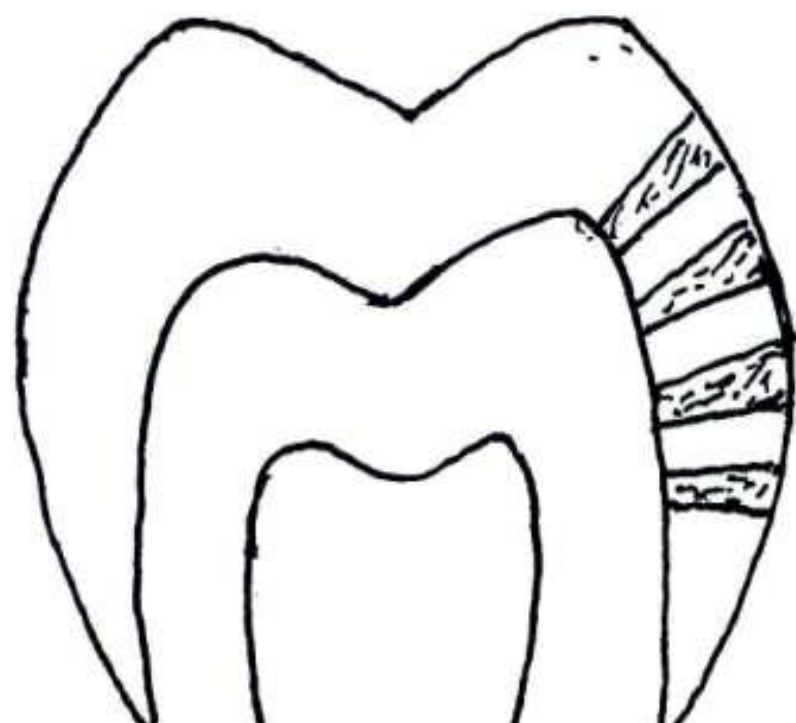
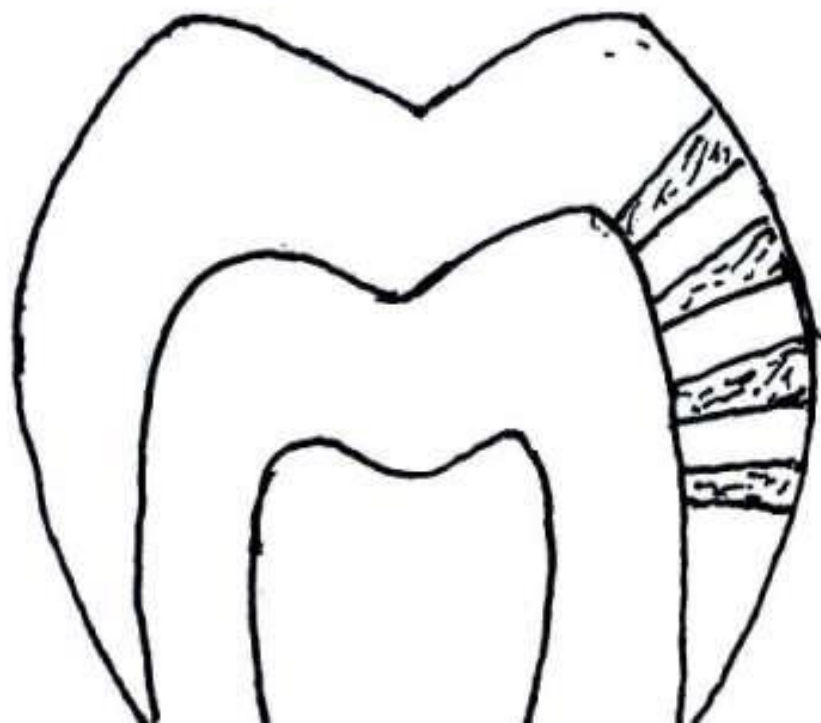




Q & A time







THANK YOU

