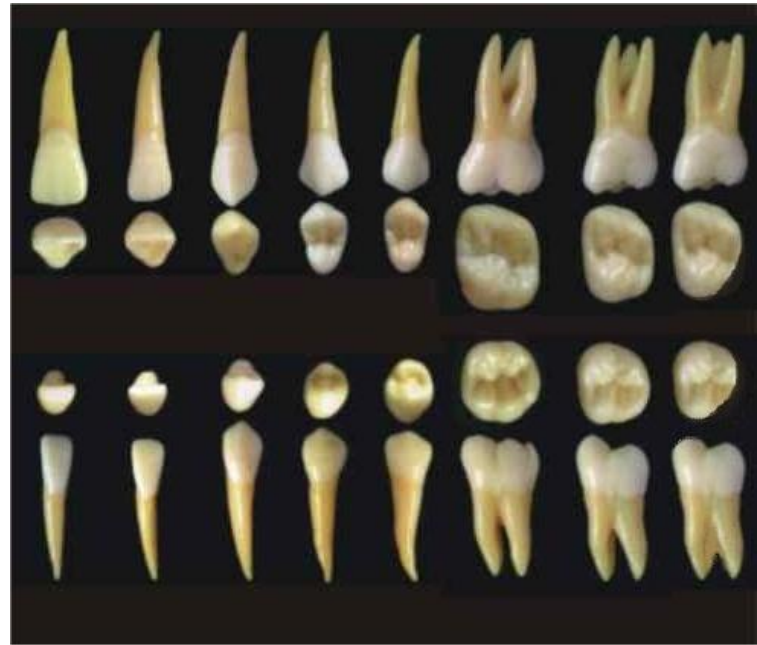
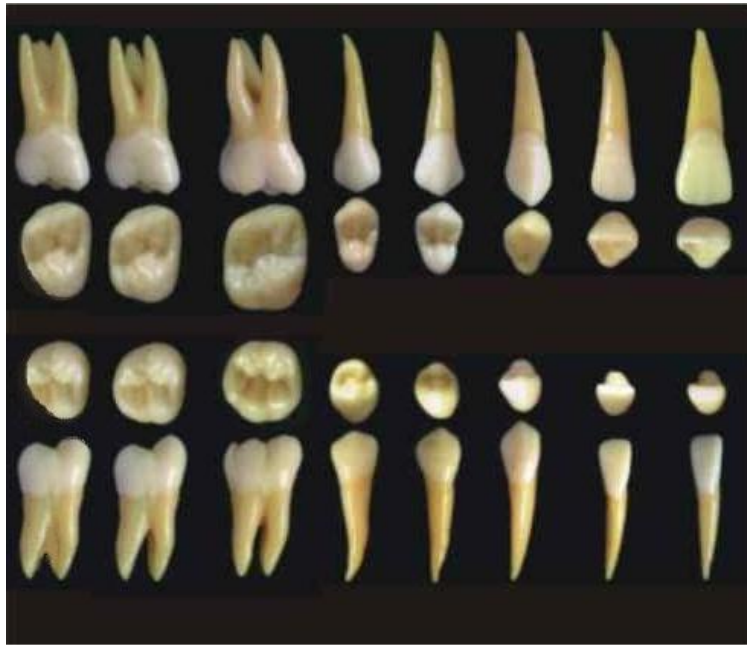




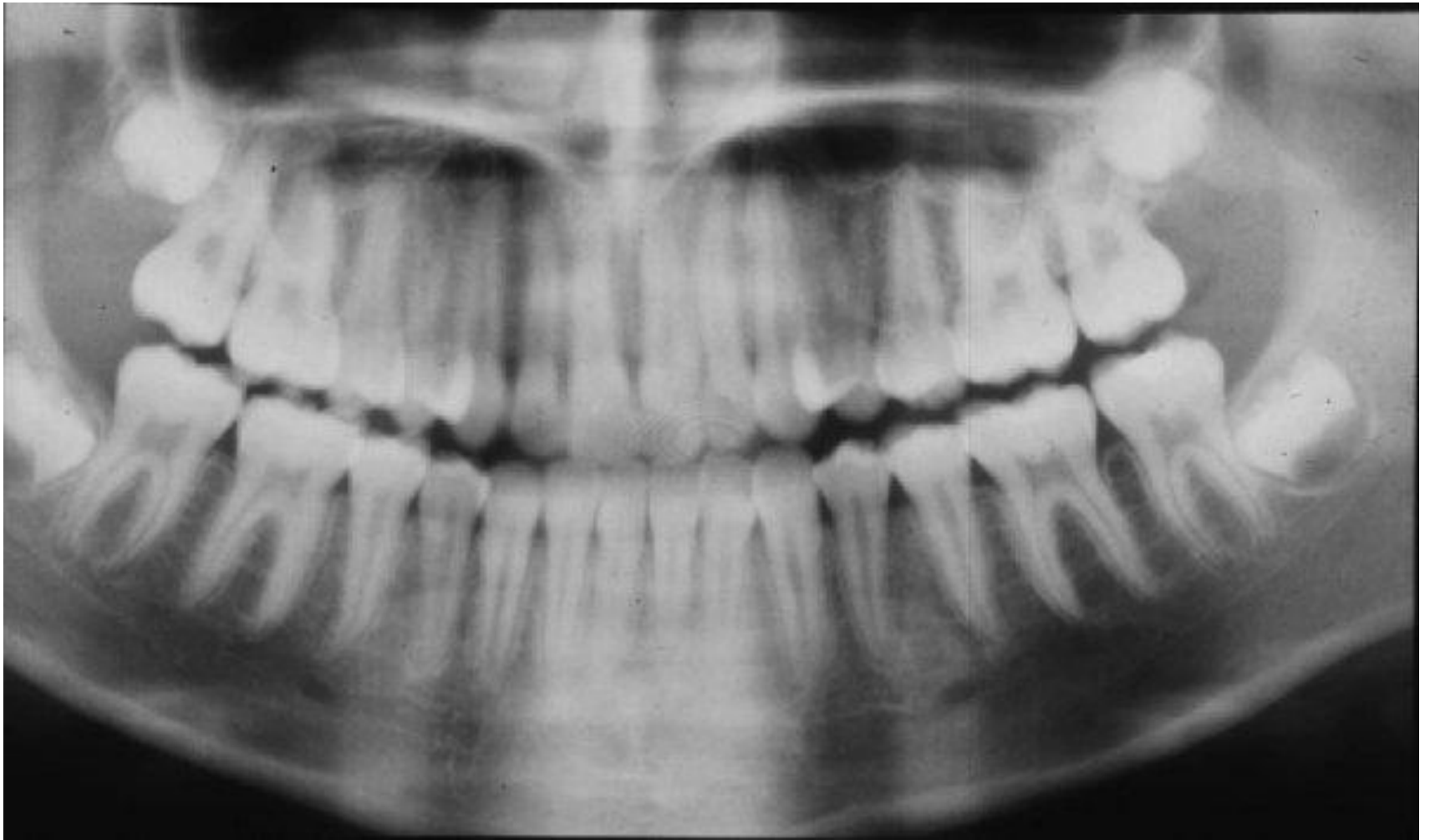
Teeth

Roger Shore

Permanent human dentition - 32 teeth







CUSP



CROWN

ROOT



Periodontium

4 Connective tissues:

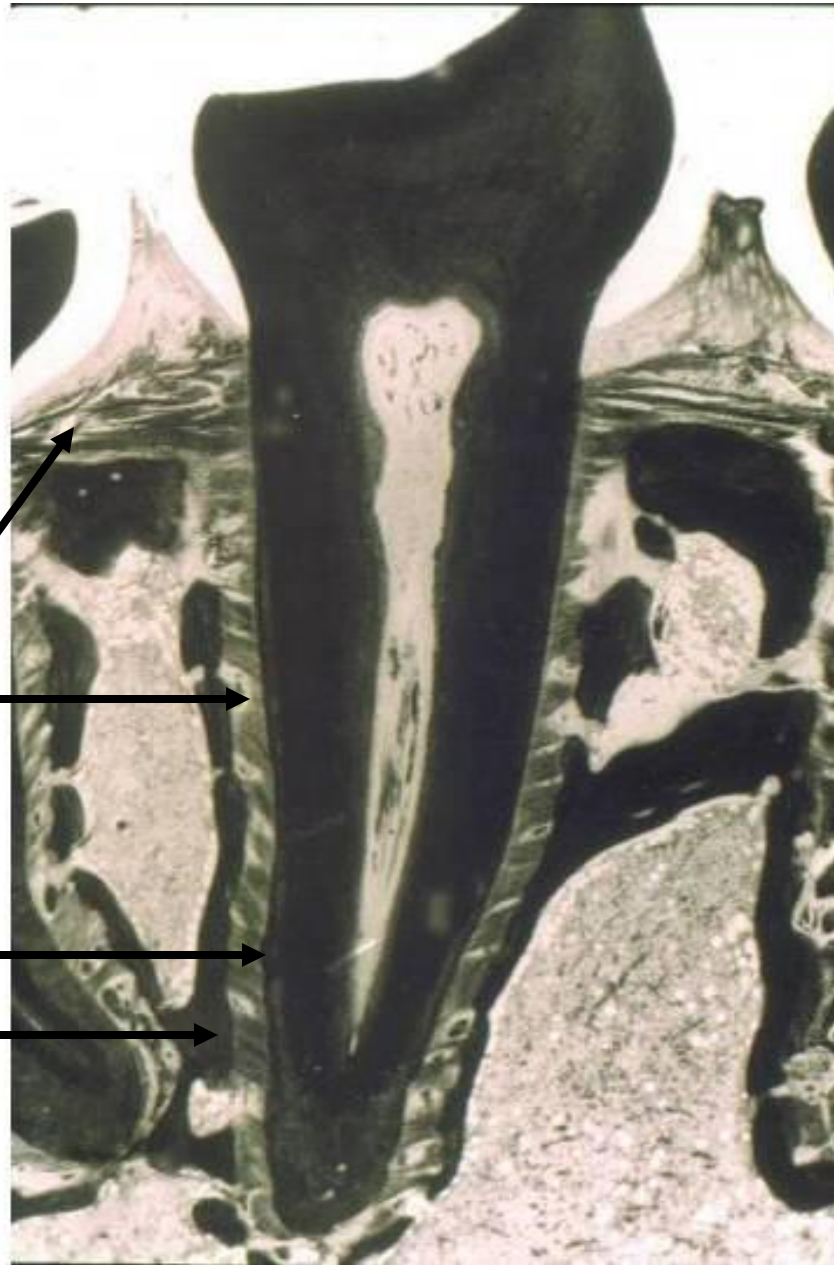
- 2 calcified
- 2 non-calcified

Non calcified

- 1. lamina propria
- 2. periodontal ligament

Calcified

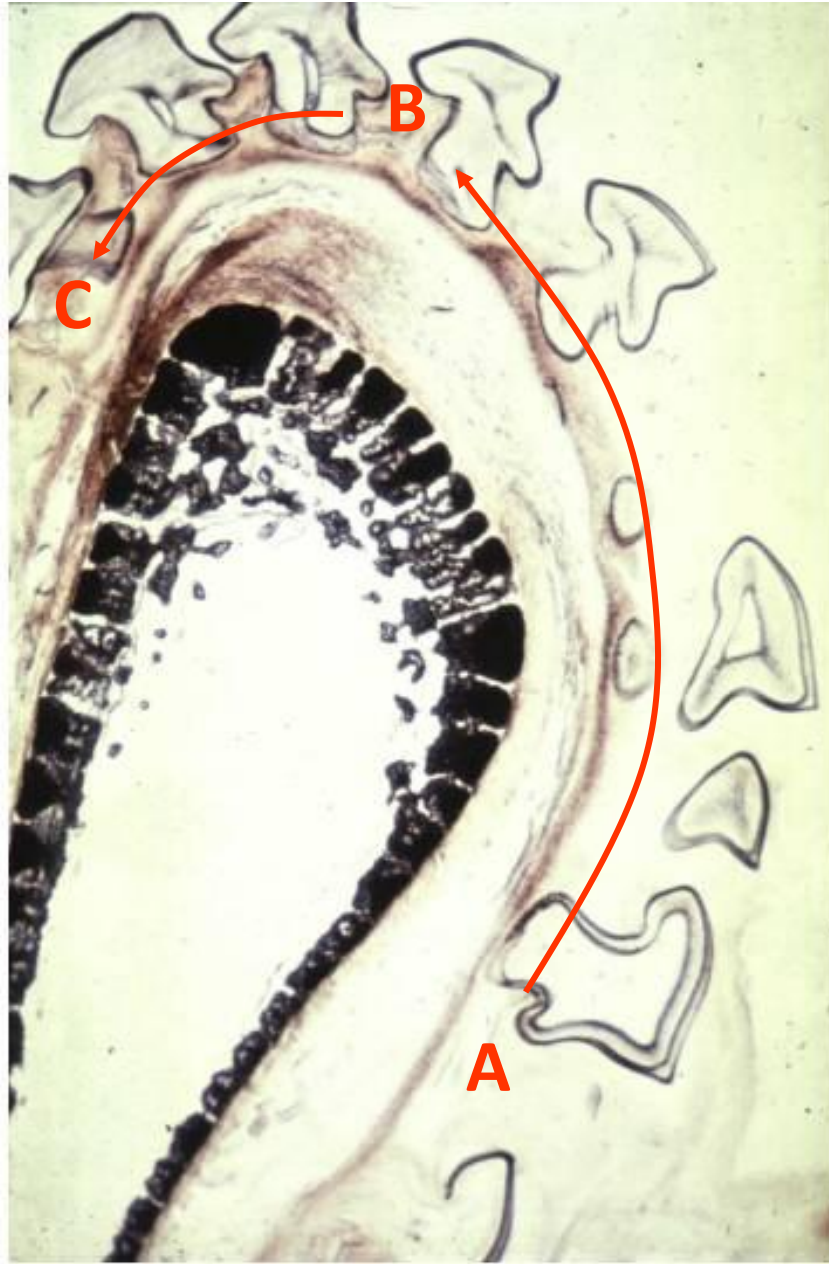
- 1. cementum
- 2. alveolar bone (lamina dura)

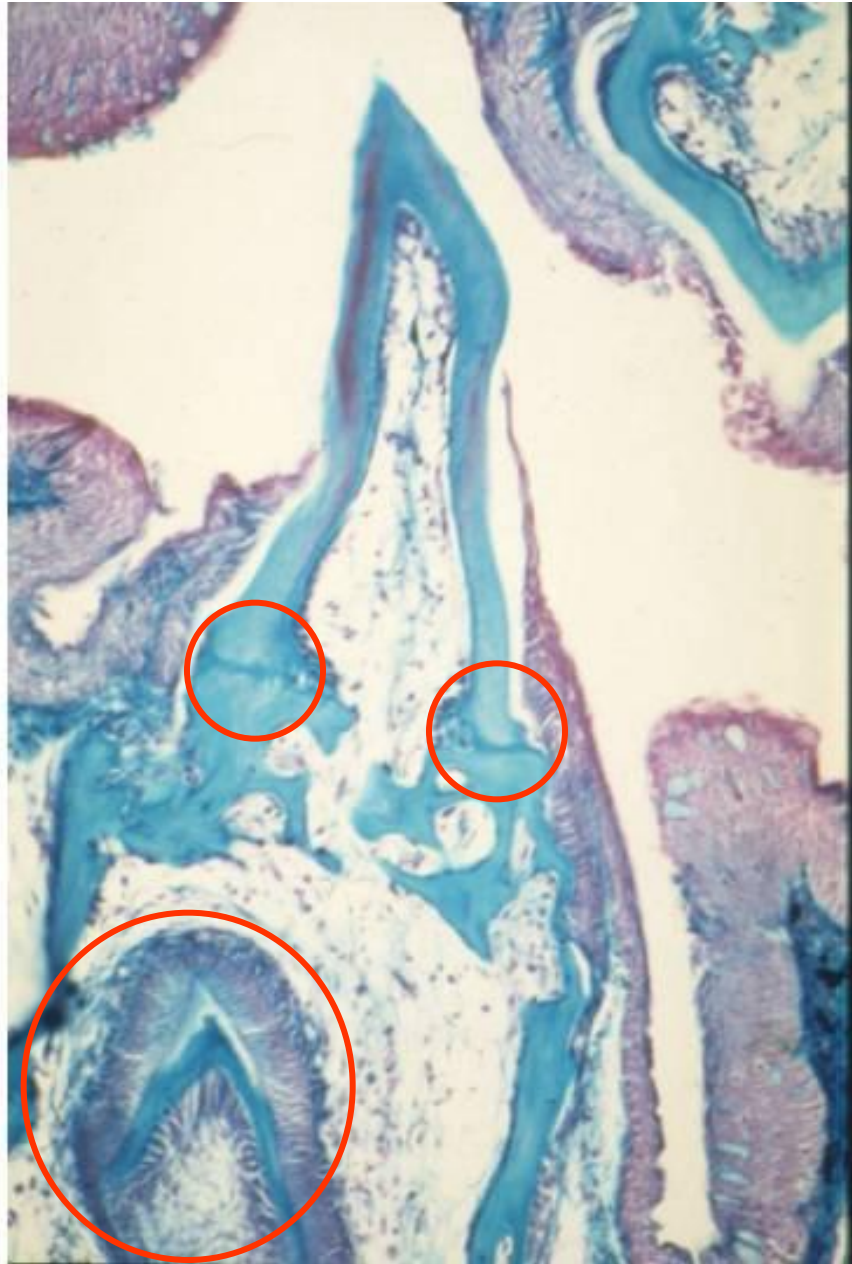












Periodontium

4 Connective tissues:

- 2 calcified
- 2 non-calcified

Non calcified

- 1. lamina propria
- 2. periodontal ligament

Calcified

- 1. cementum
- 2. alveolar bone (lamina dura)



Common element

fibrous collagen
is the bulk protein

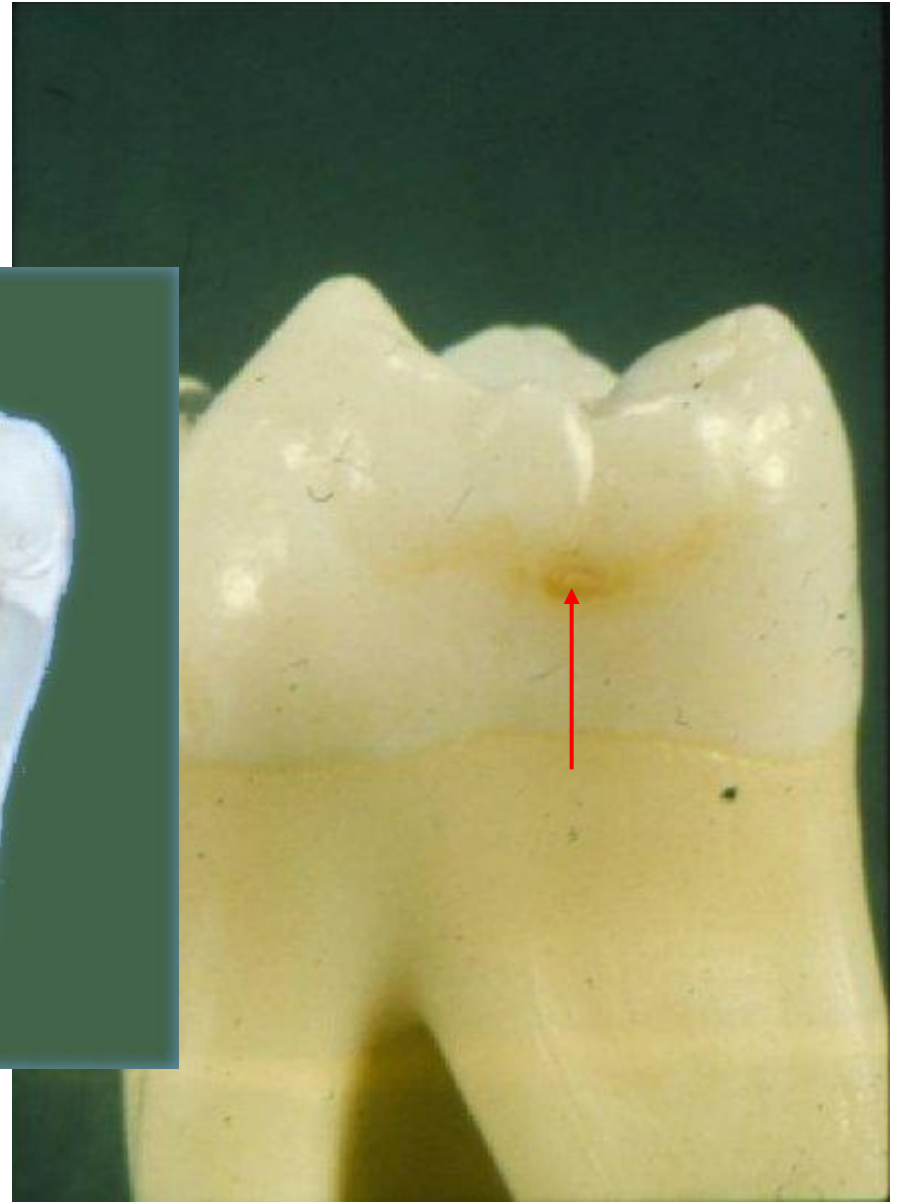
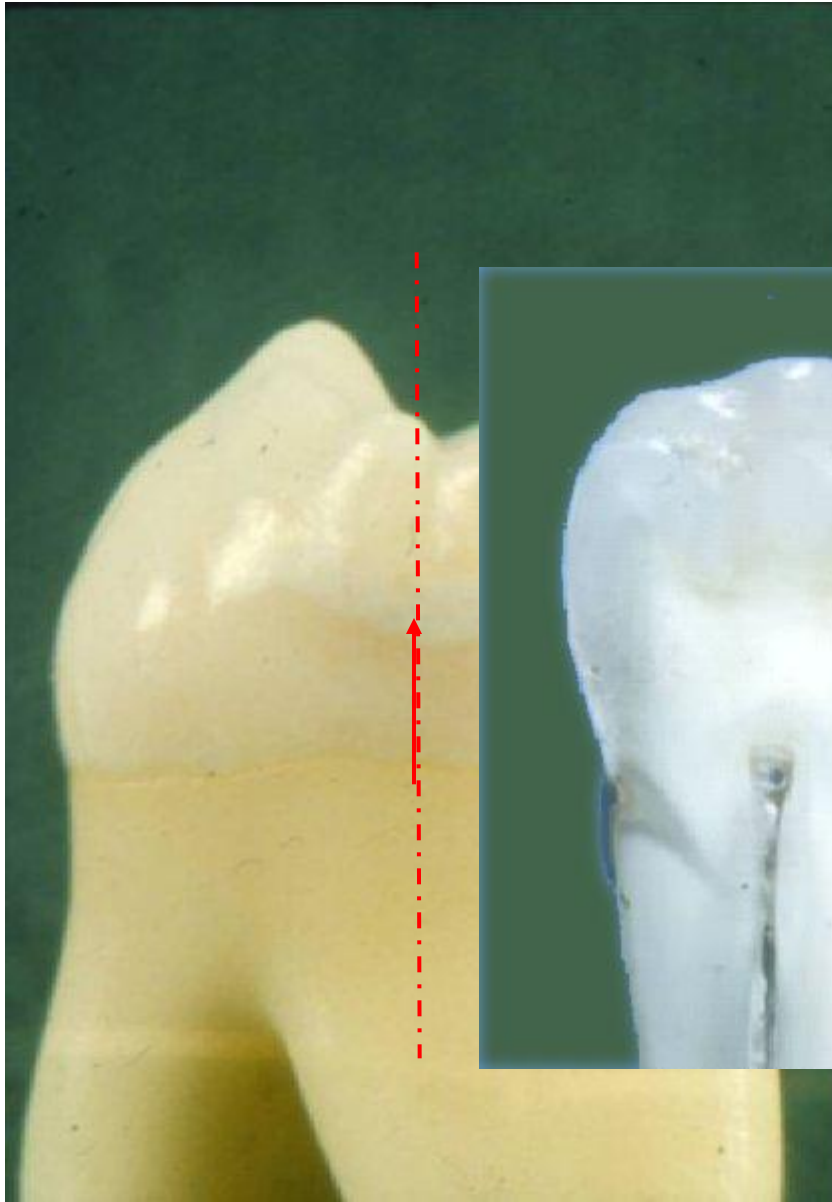


CROWN



ROOT





ENAMEL 1

PHYSICAL PROPERTIES:

Very hard and brittle – relies on DENTINE for resilience

Colour dictated by its translucency and colour of underlying dentine

CHEMICAL COMPOSITION:

96-99% mineral by weight (hydroxyapatite) (c.f. 60% for bone)

3% water

1% organic (mainly protein but not collagen)

Amelogenesis imperfecta

- a. Local hypoplastic
- b. Pitted hypoplastic
- c. Rough hypoplastic
- d. Hypomature
- e. Hypocalcified



A



B



C



D



E

ENAMEL 2

BASIC STRUCTURE:

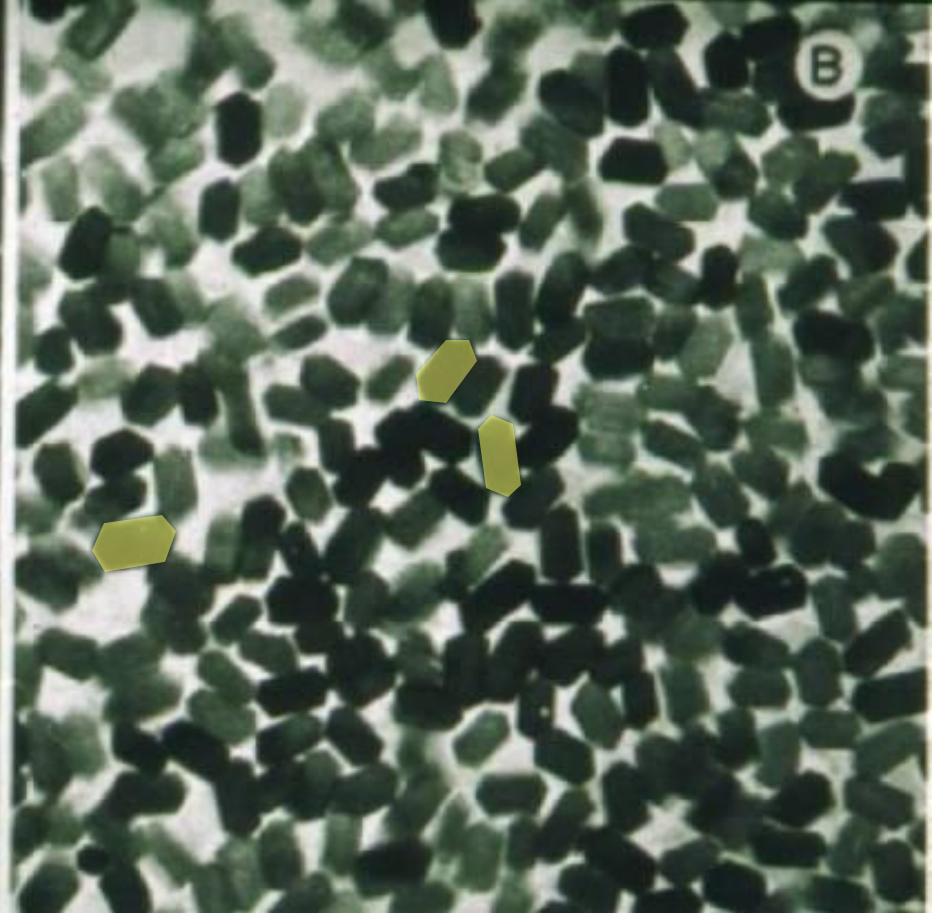
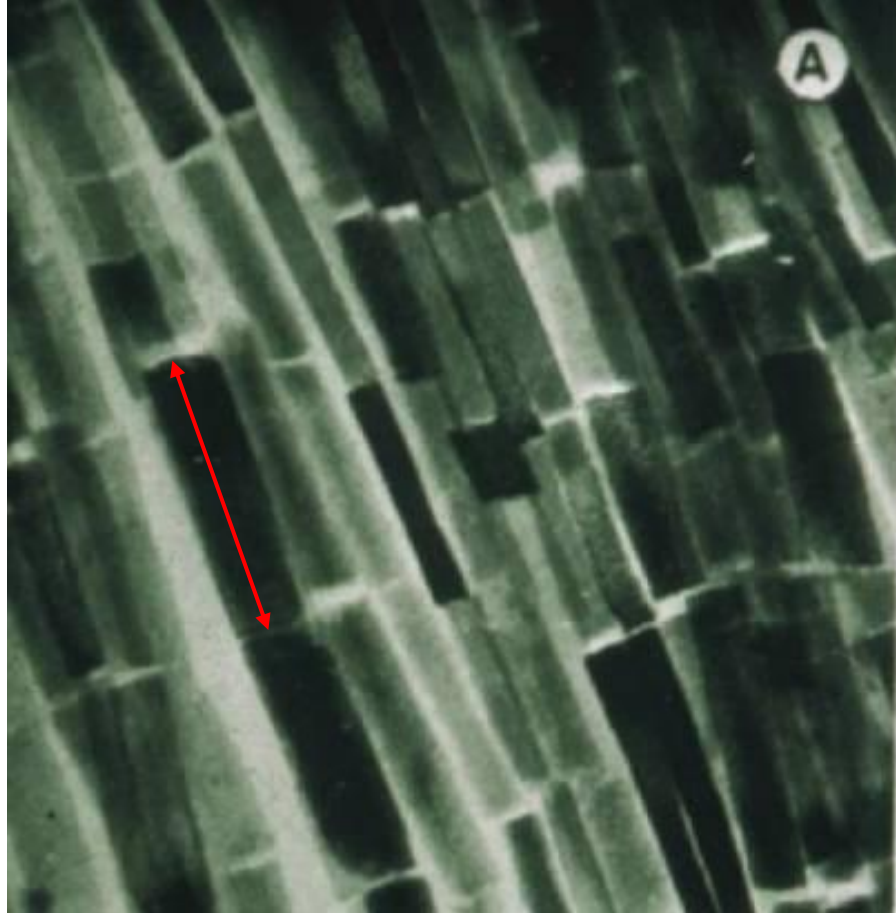
Hydroxyapatite crystal 60-90nm x 25-30nm x ?

(c.f. bone crystals 40nm x 5-10nm x 50nm)



Crystals arranged into PRISMS (RODS) (approx 5µm diameter)

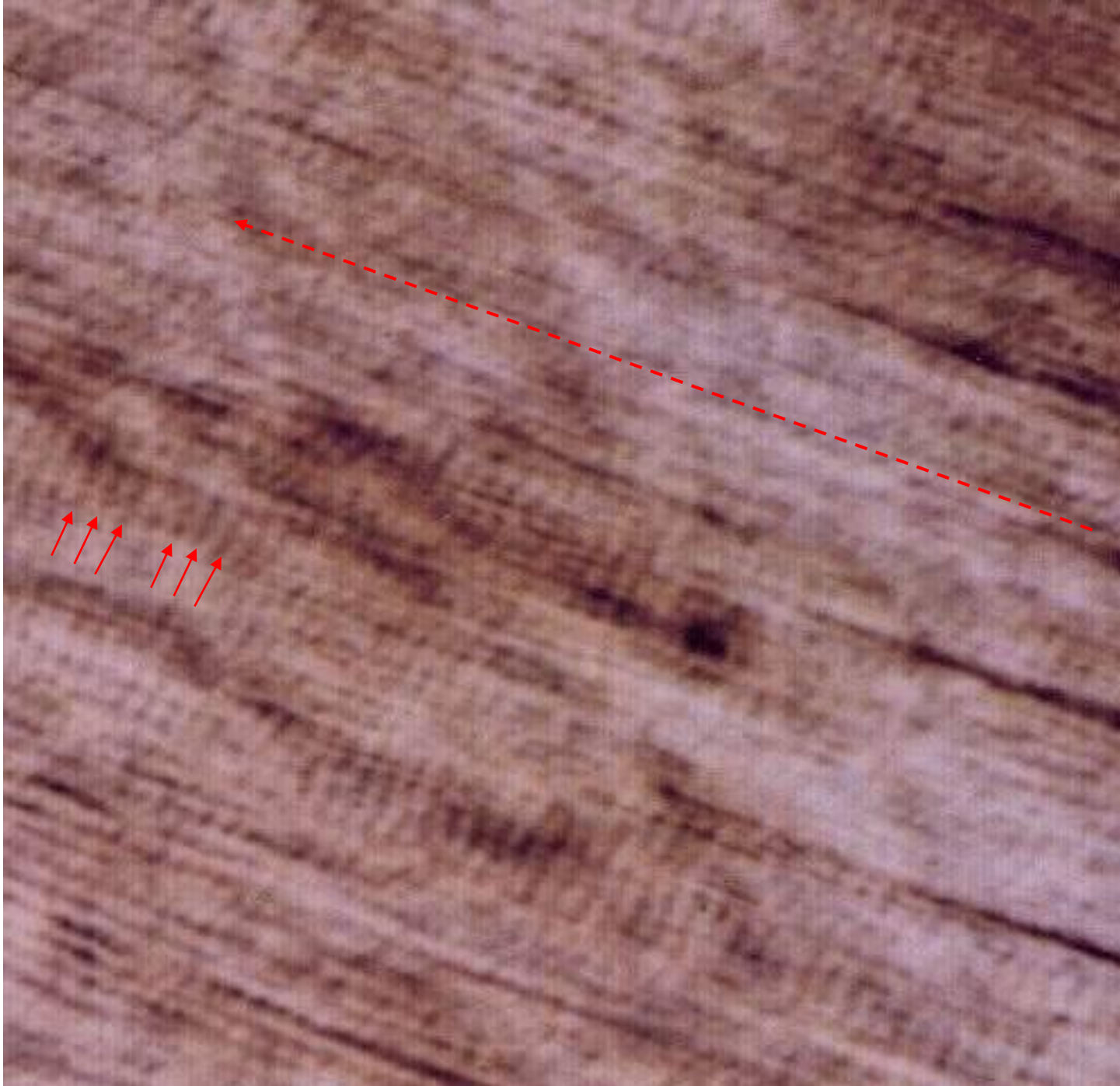
Prisms perpendicular to ADJ



Tooth surface →

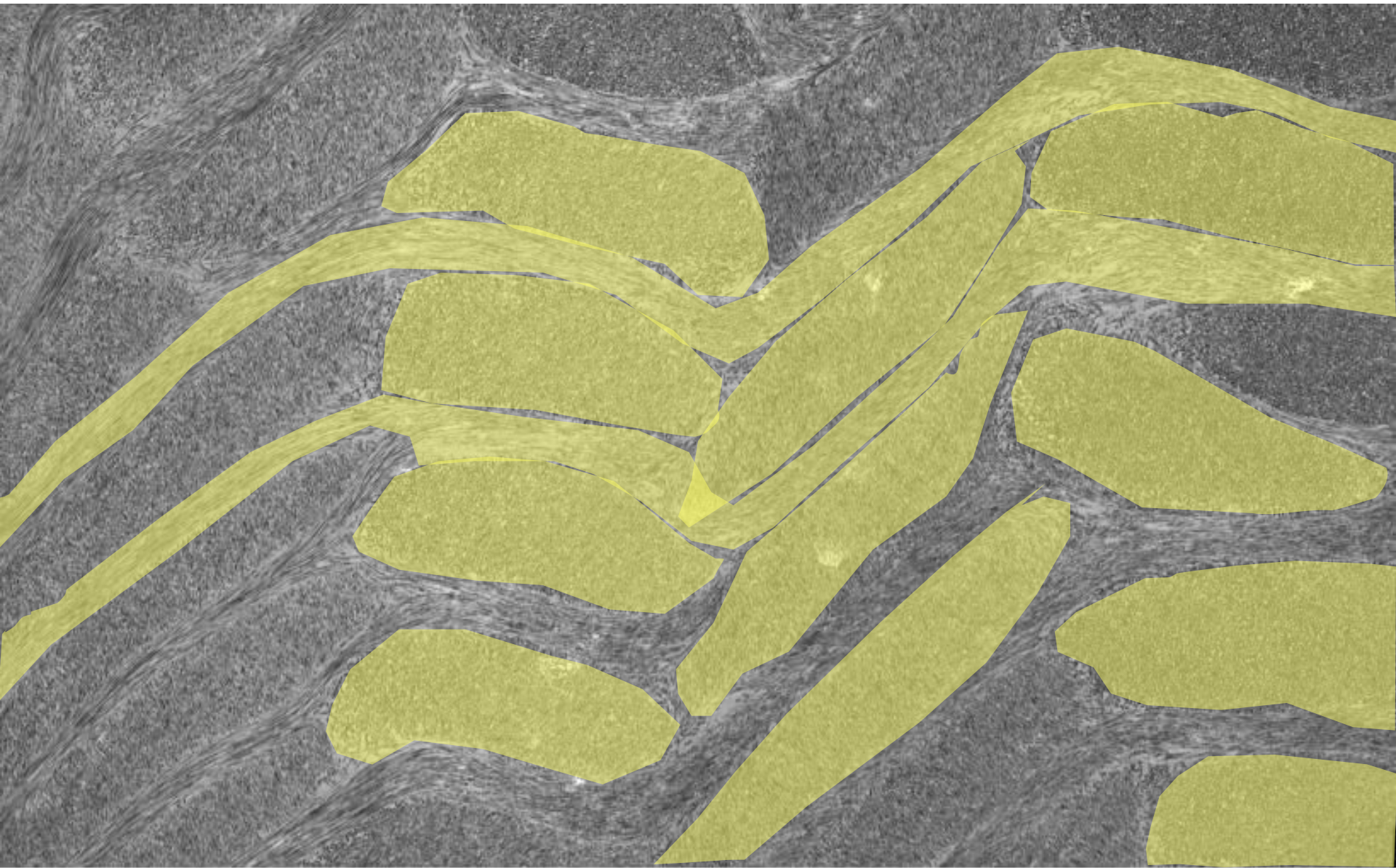


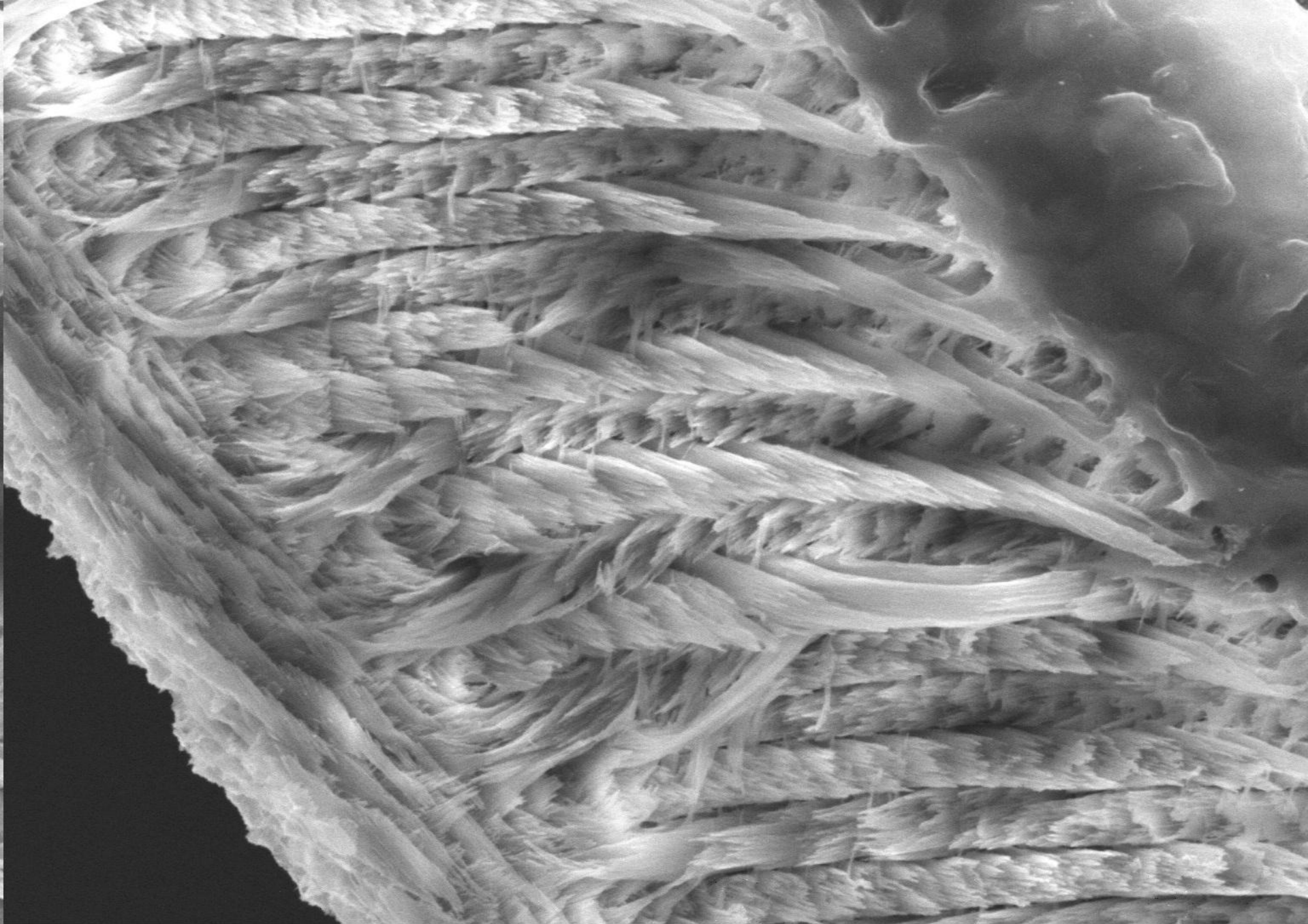
← **Amelo-dentinal junction**



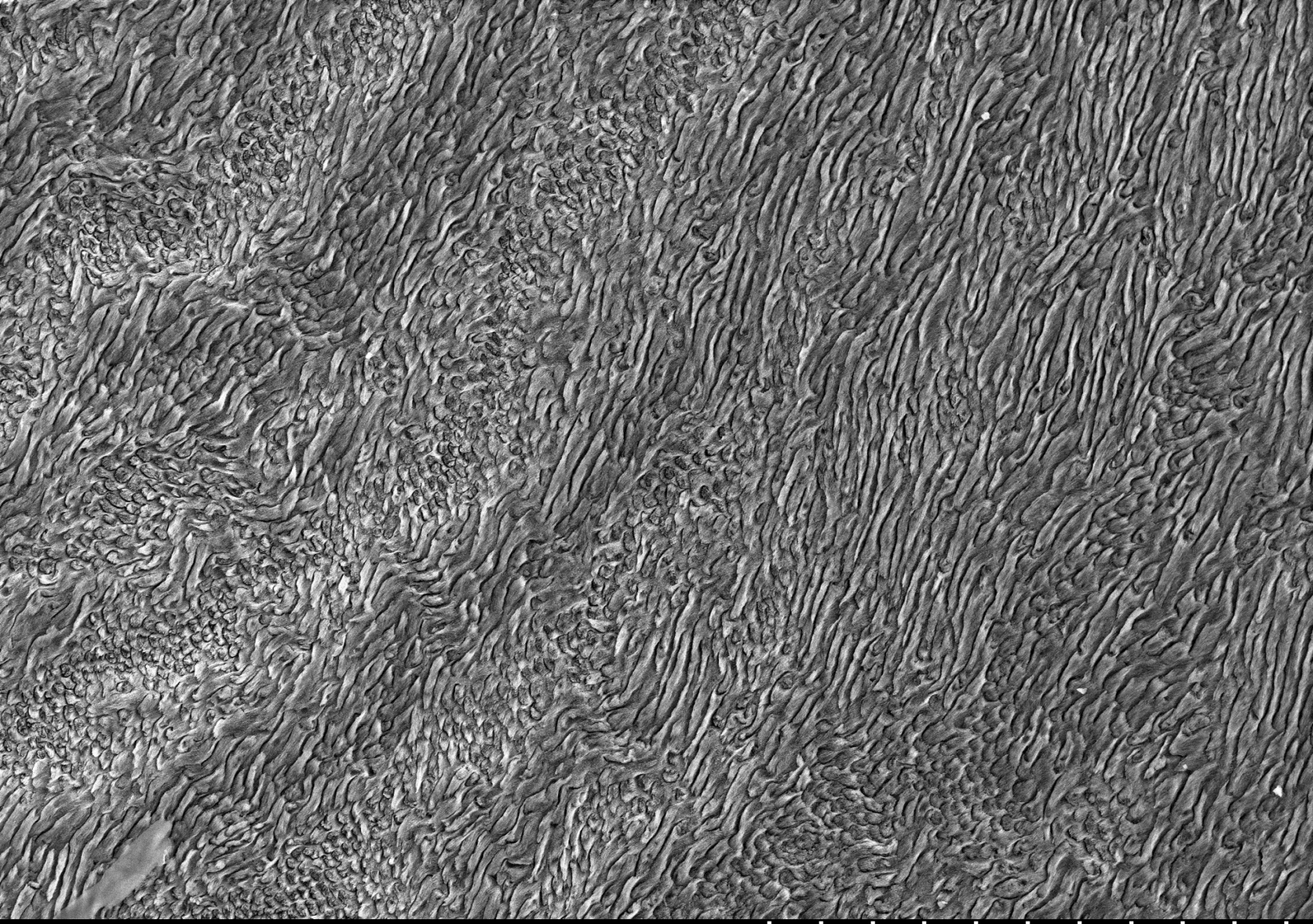






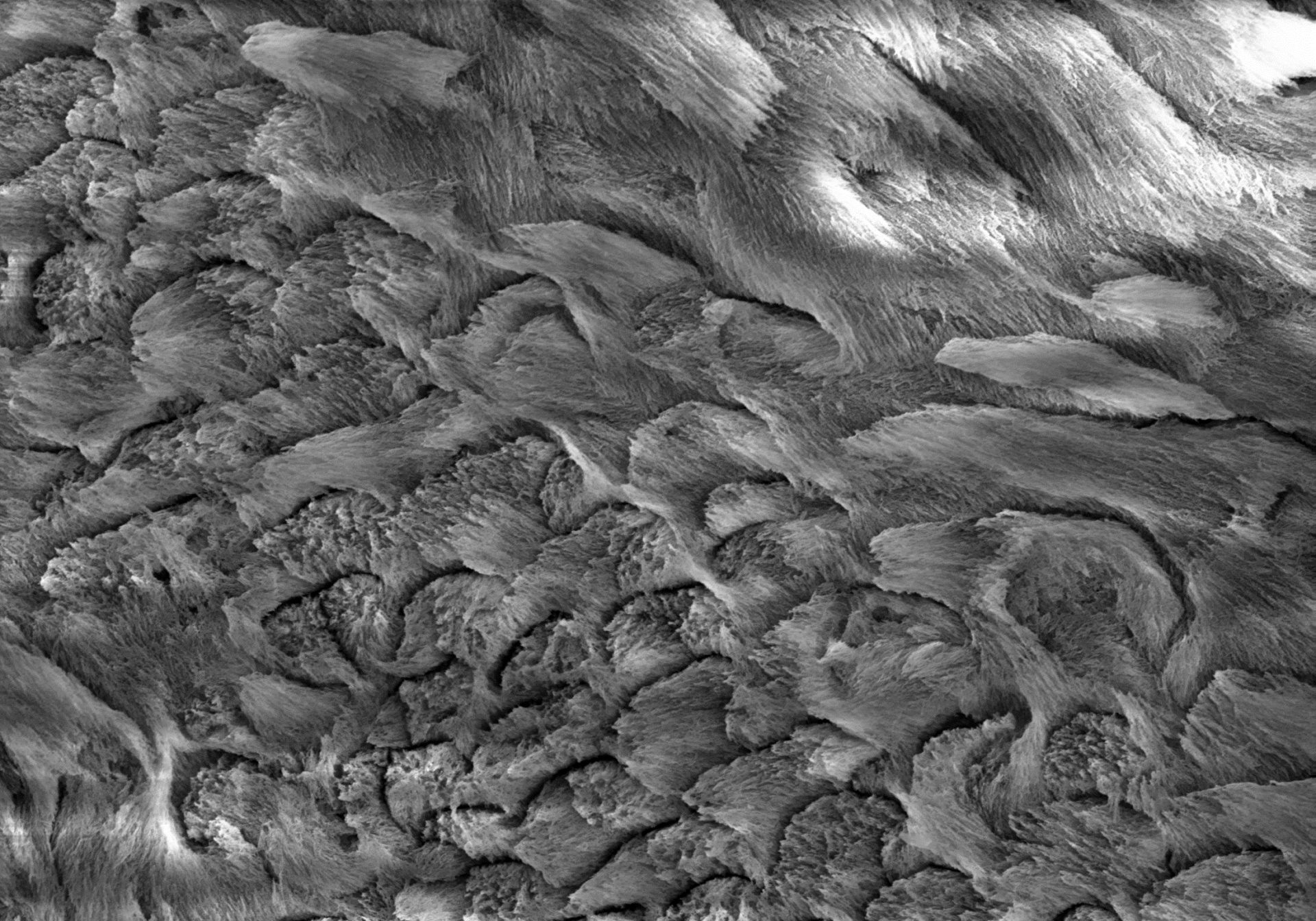


20um



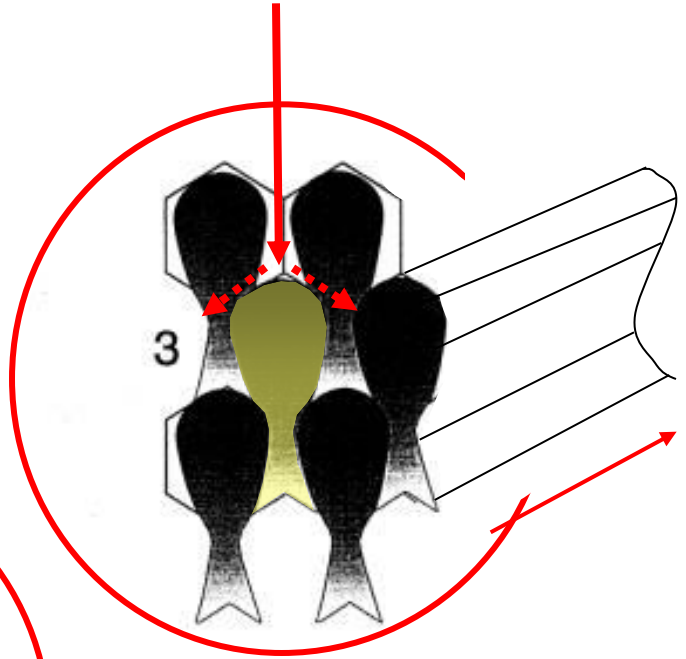
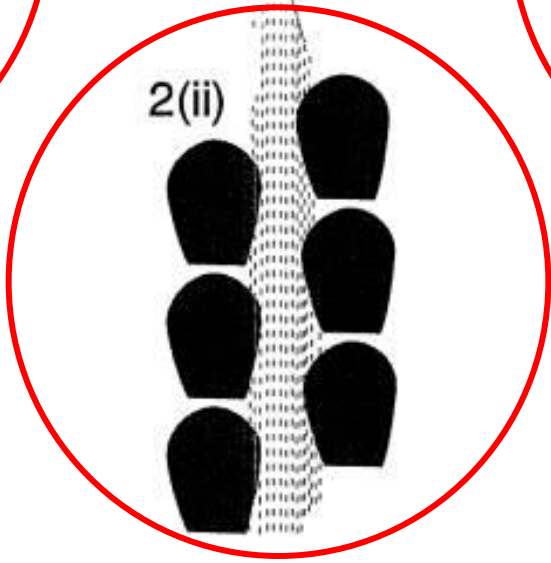
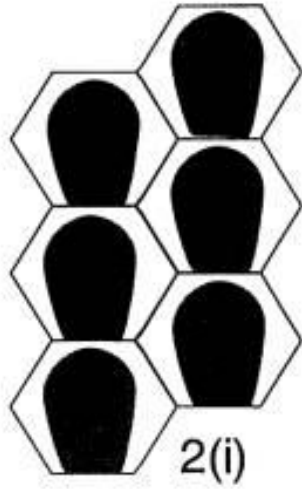
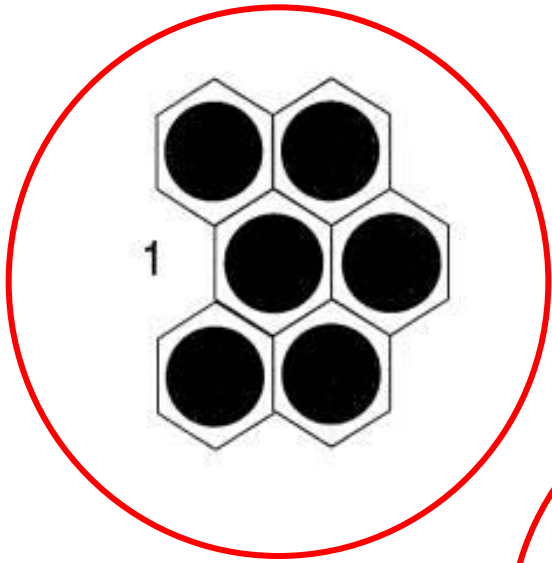
S3400 20.0kV 5.7mm x250 SE

200um



S3400 20.0kV 5.7mm x2.10k SE

20.0um





CROWN



ROOT





DENTINE

PHYSICAL PROPERTIES:

Slightly harder than bone

Elastic, not brittle

Yellow in colour

CHEMICAL COMPOSITION:

65% mineral (by wt), 35% organic and water

Organic mainly COLLAGEN but also
proteoglycans and glycoproteins

DENTINE 2

BASIC STRUCTURE:

Hydroxyapatite crystal

Crystals arranged mainly parallel to collagen (meshwork)

Dentinal tubules containing ODONTOBLAST process

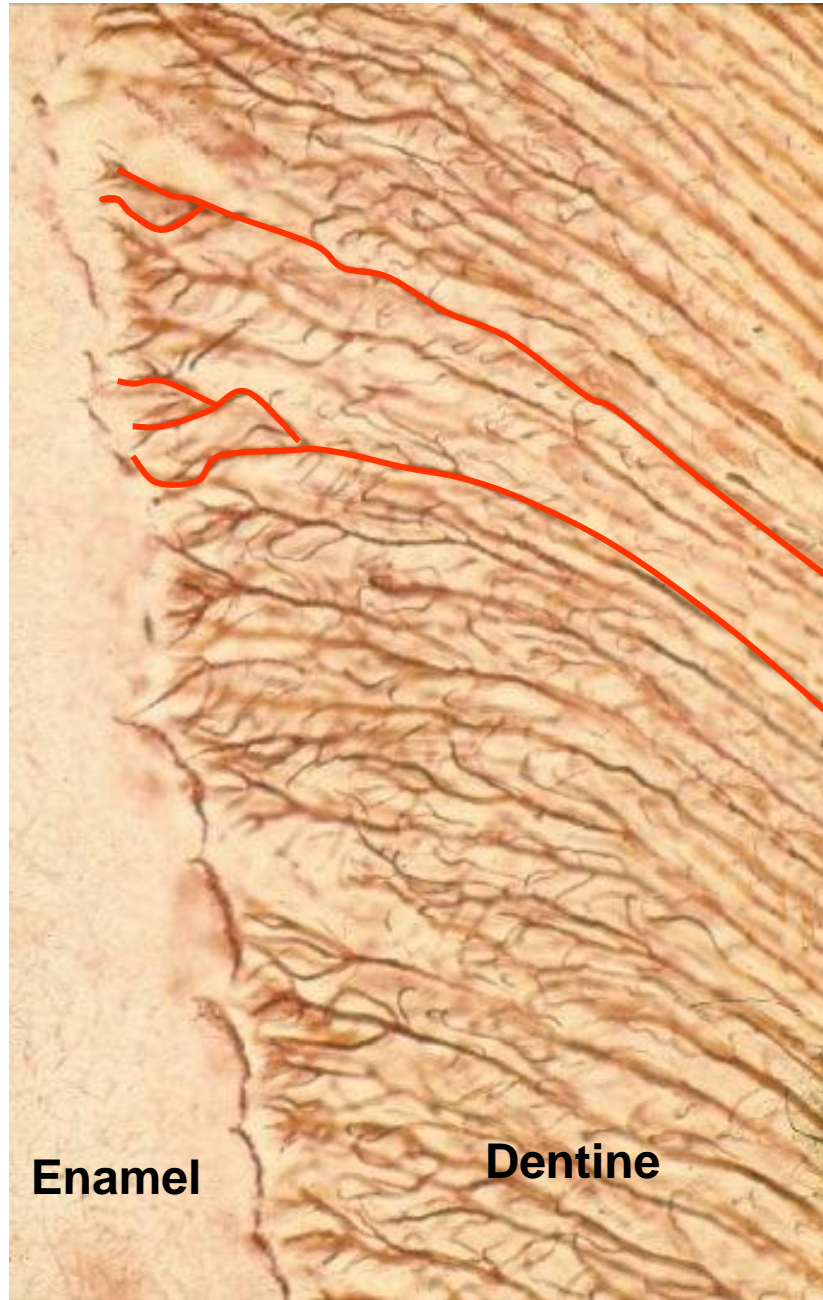
Tubule extends from pulp to ADJ (odont. process also?)

Tubules not straight, they have –

- primary curvature (resembles 'S' shape)

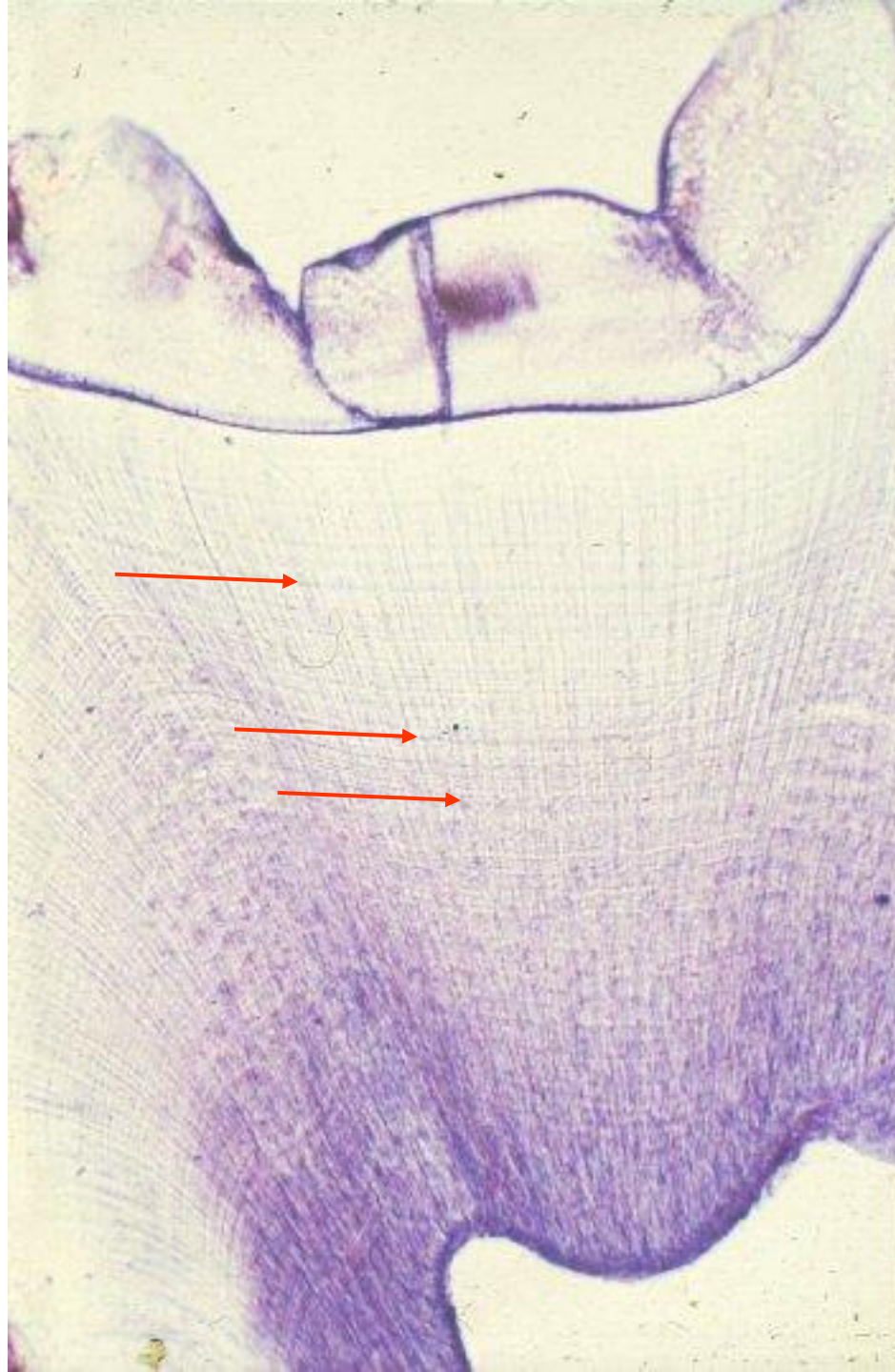
- secondary curvatures (small, relatively regular wave-like deviations superimposed on primary c.)

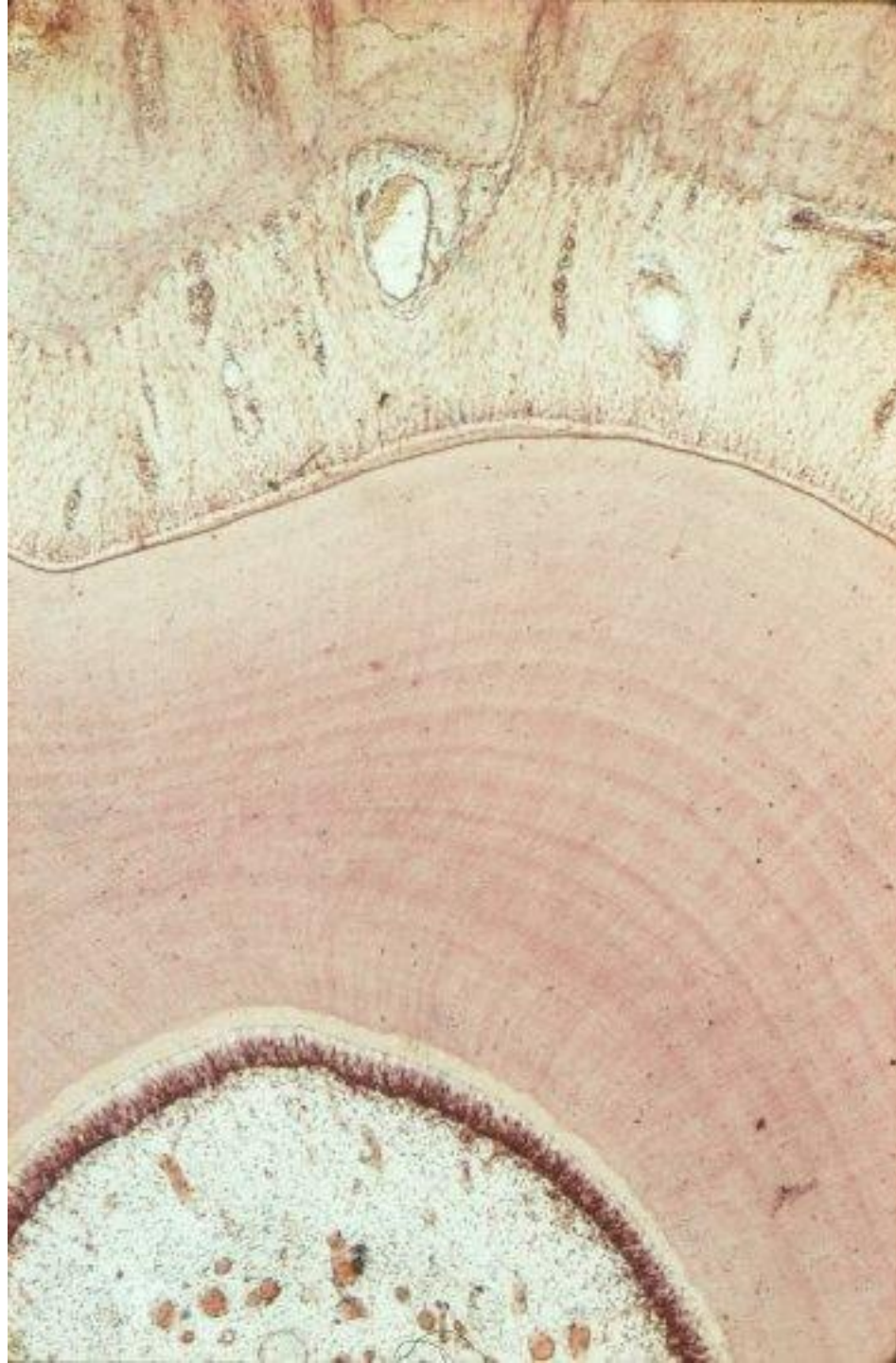
Tubules branched (mainly at ADJ)



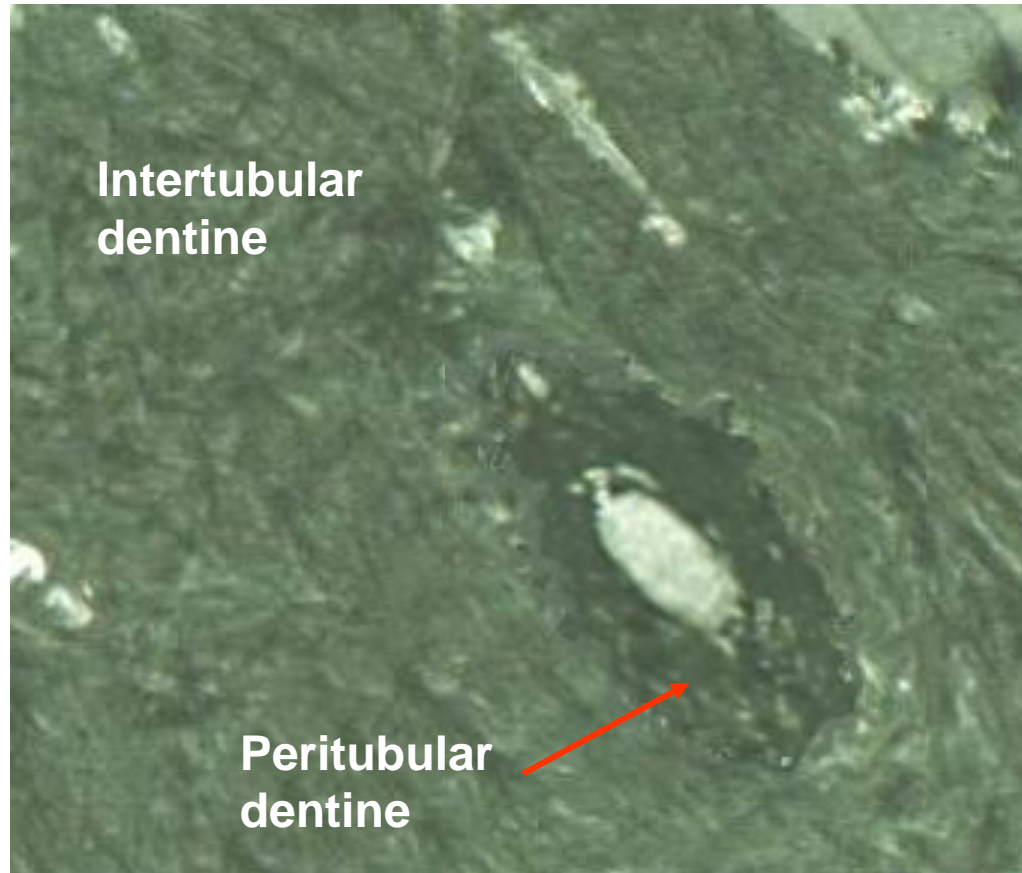
Enamel

Dentine





3. PERITUBULAR (hypermineralised) and INTERTUBULAR







Age

13

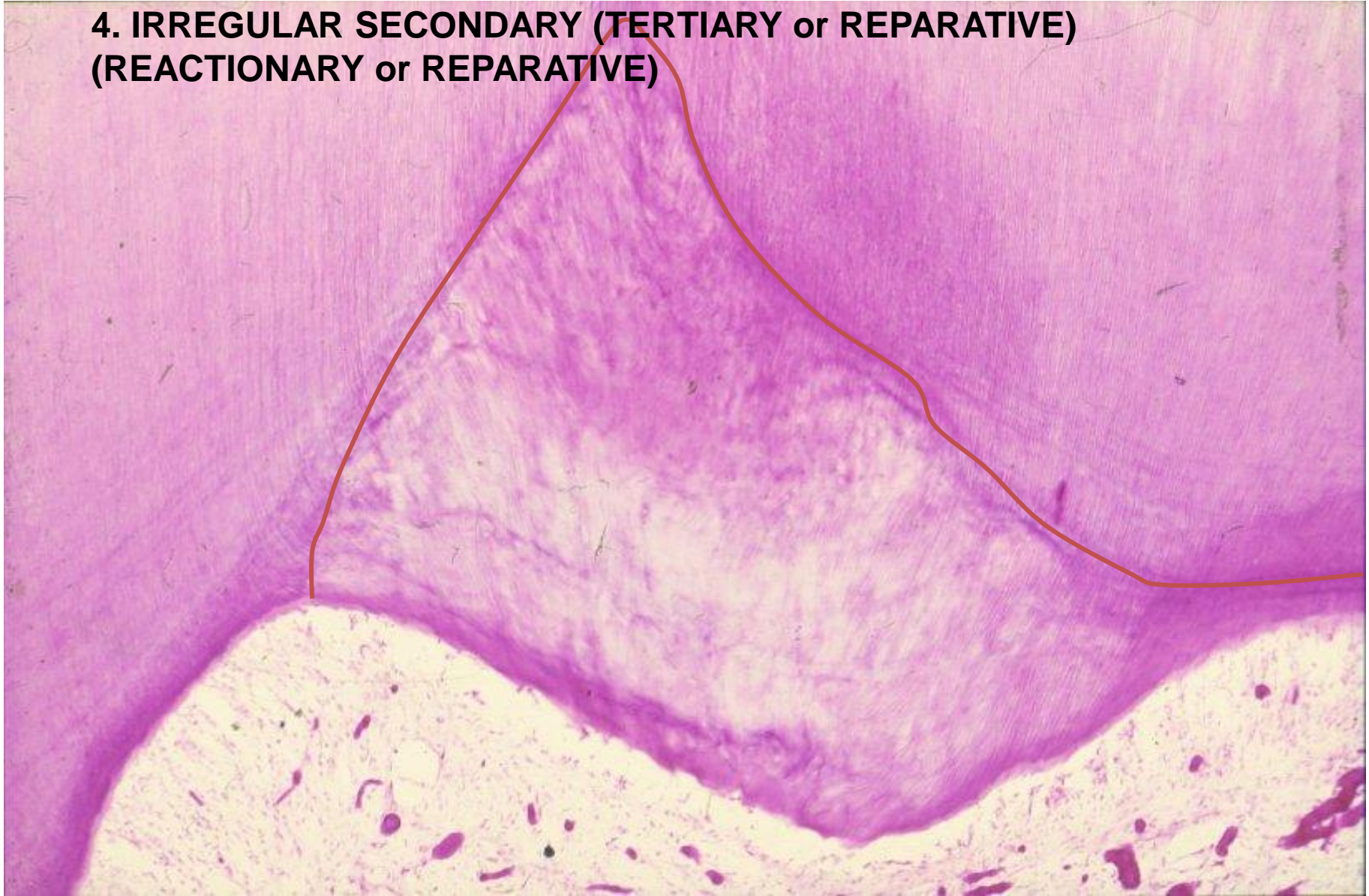
24

32

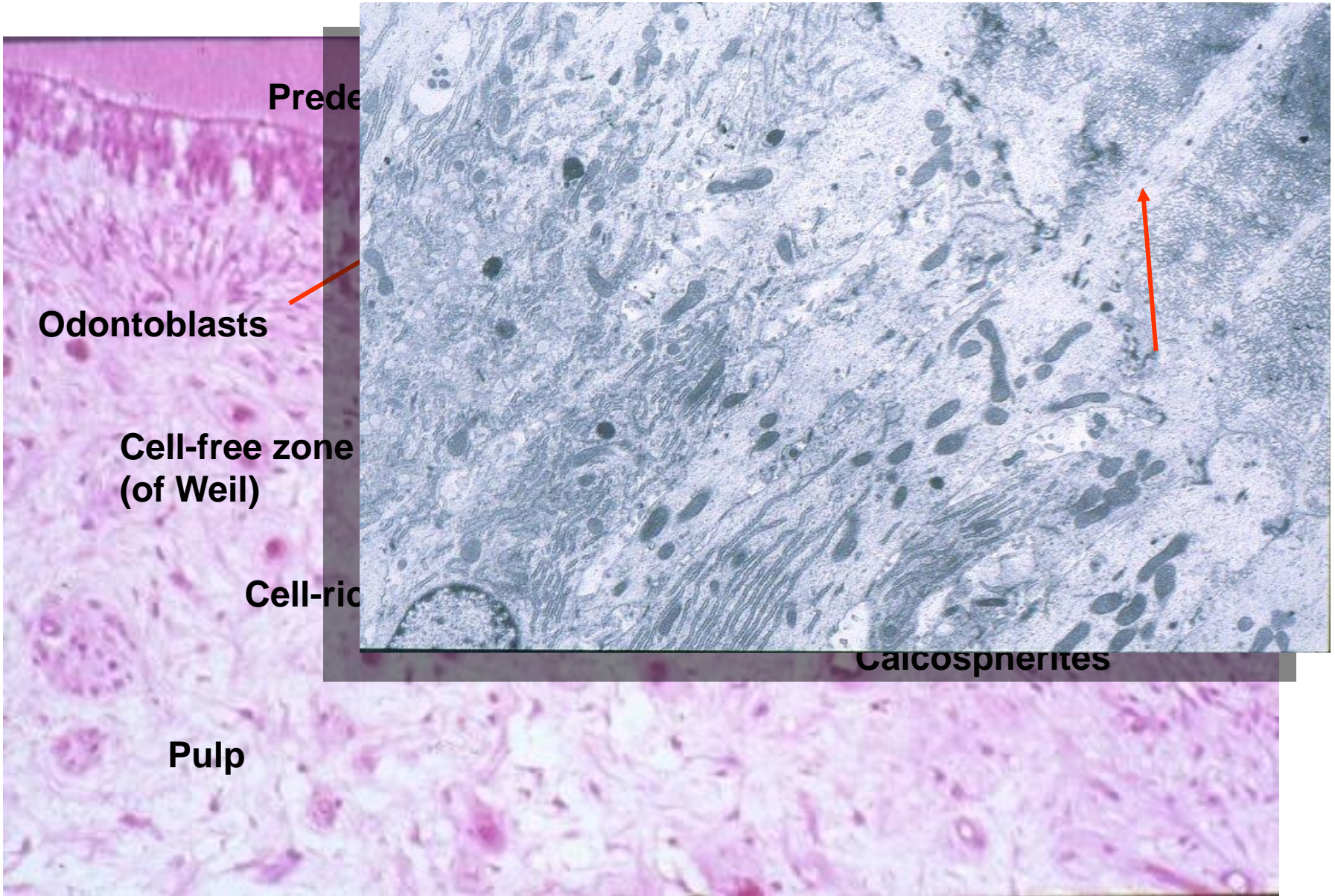
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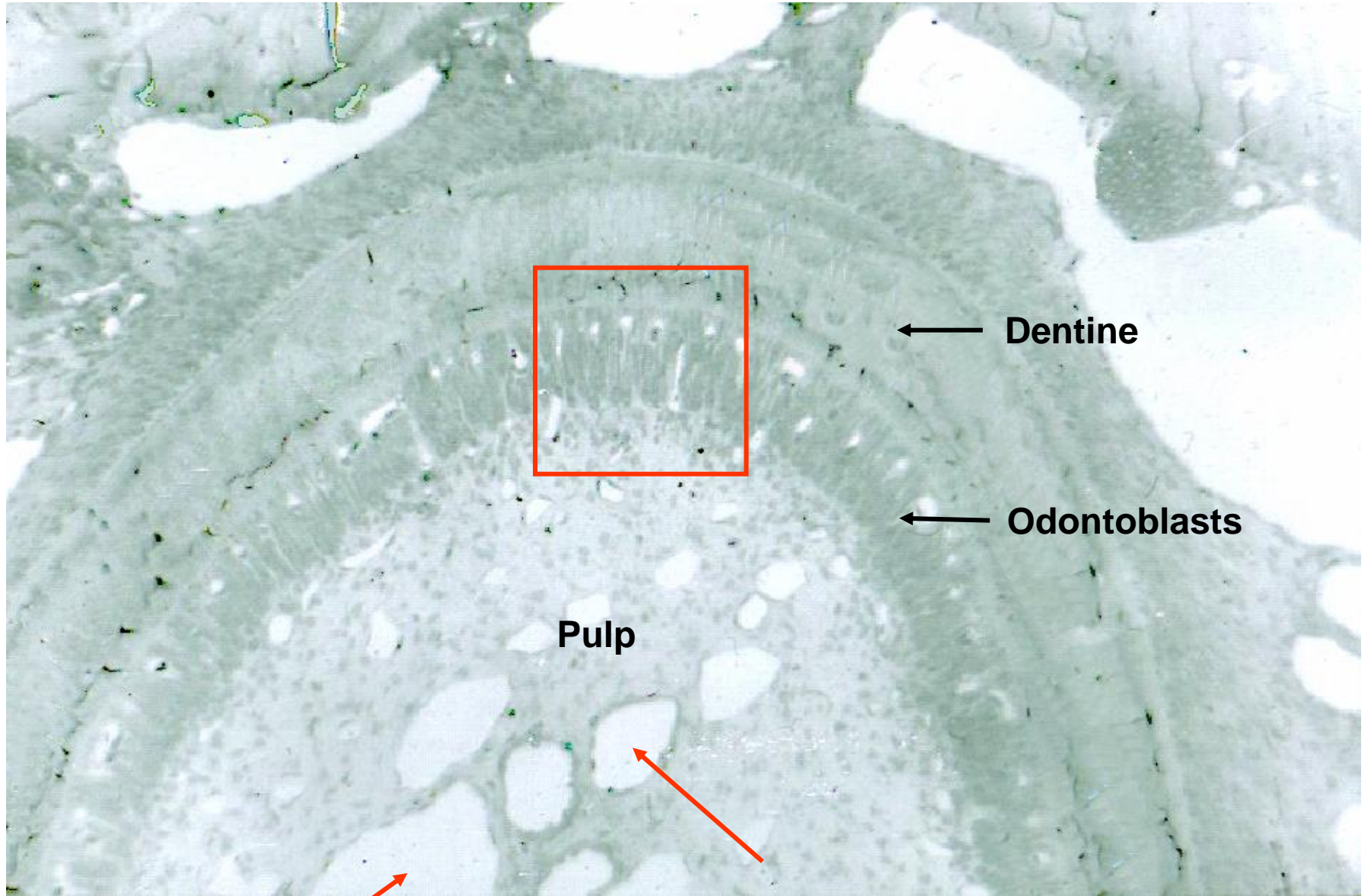
65

**4. IRREGULAR SECONDARY (TERTIARY or REPARATIVE)
(REACTIONARY or REPARATIVE)**







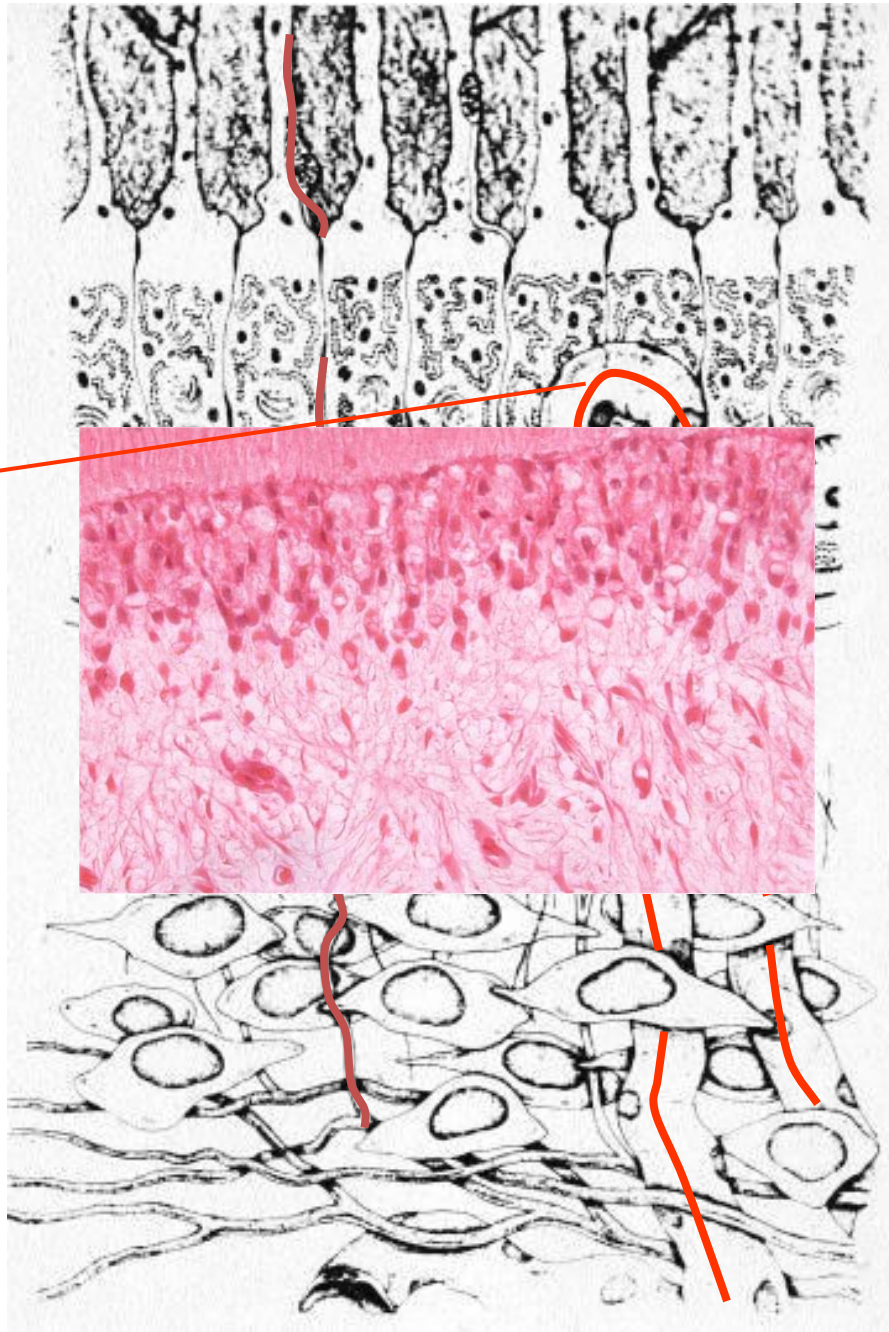


← Dentine

← Odontoblasts

Pulp





Predentine

Odontoblasts

**Cell-free
zone**

**Cell-rich
zone**

**Nerve plexus
of Raschkow**

PROPOSED MECHANISMS OF DENTINE SENSITIVITY

1. Direct innervation
2. Odontoblasts act as sensory endings
3. Hydrodynamics (fluid flow)

Direct innervation

Hydrodynamic

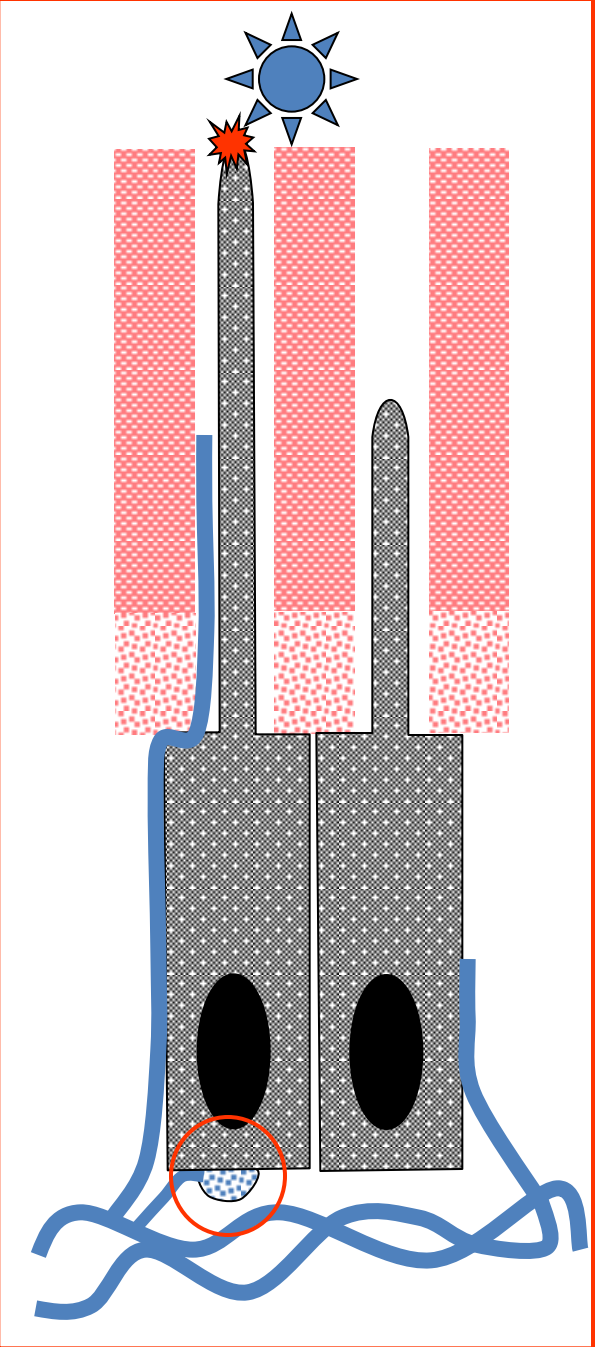
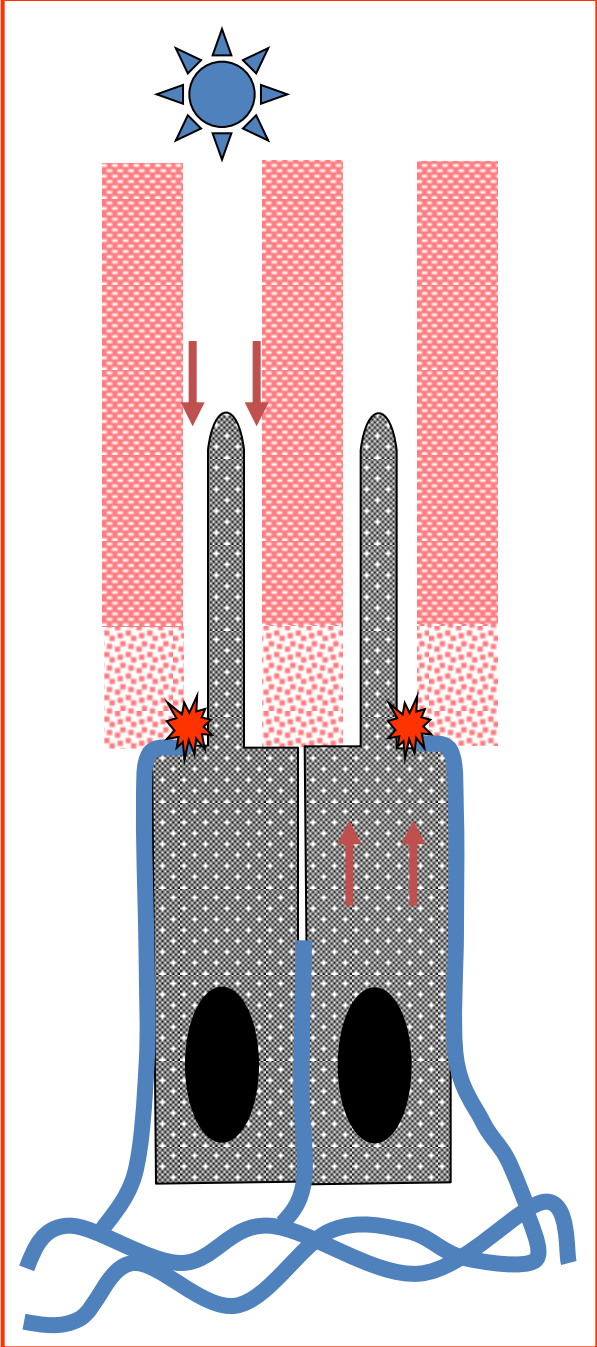
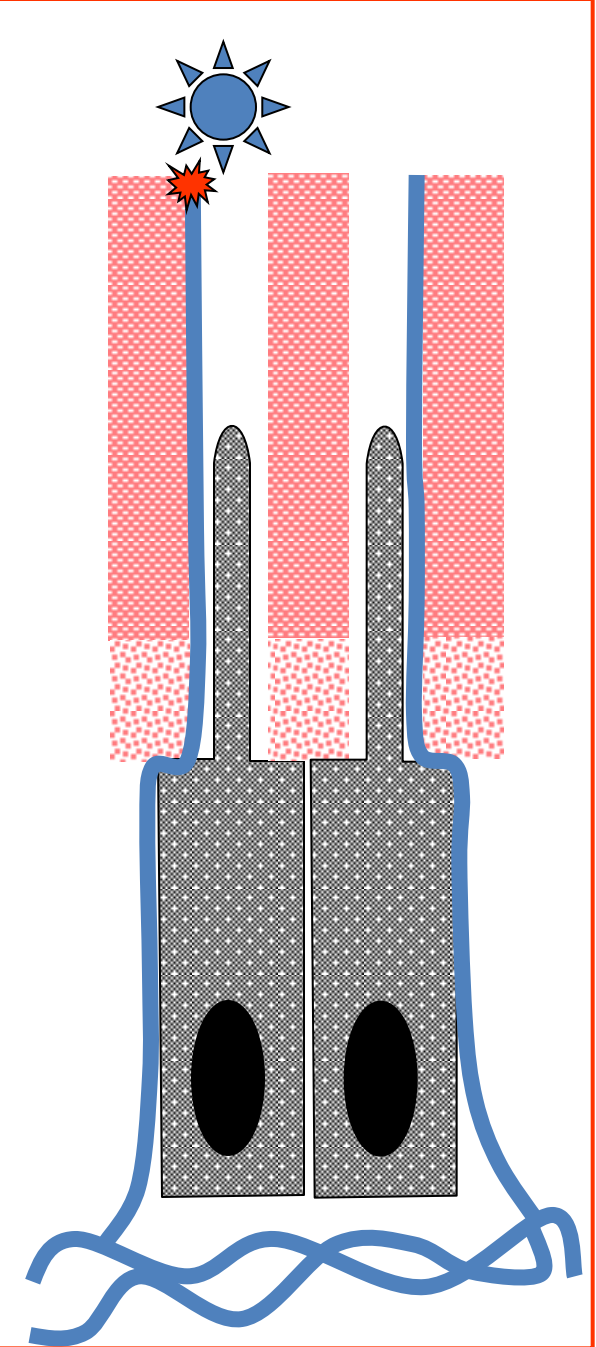
Odontoblast as ending

Dentine

Pre-dentine

Odontoblasts

Nerve plexus



The End