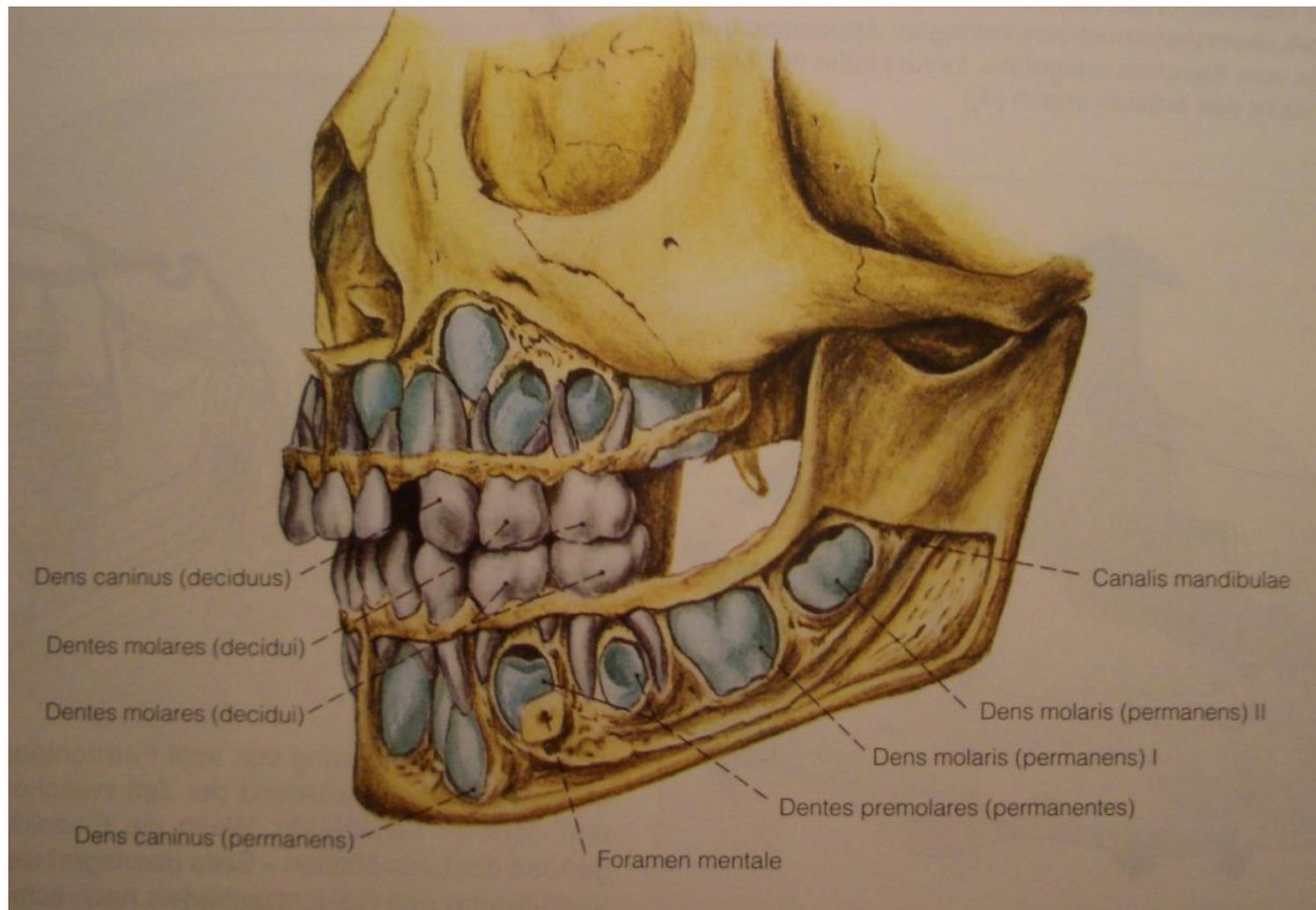


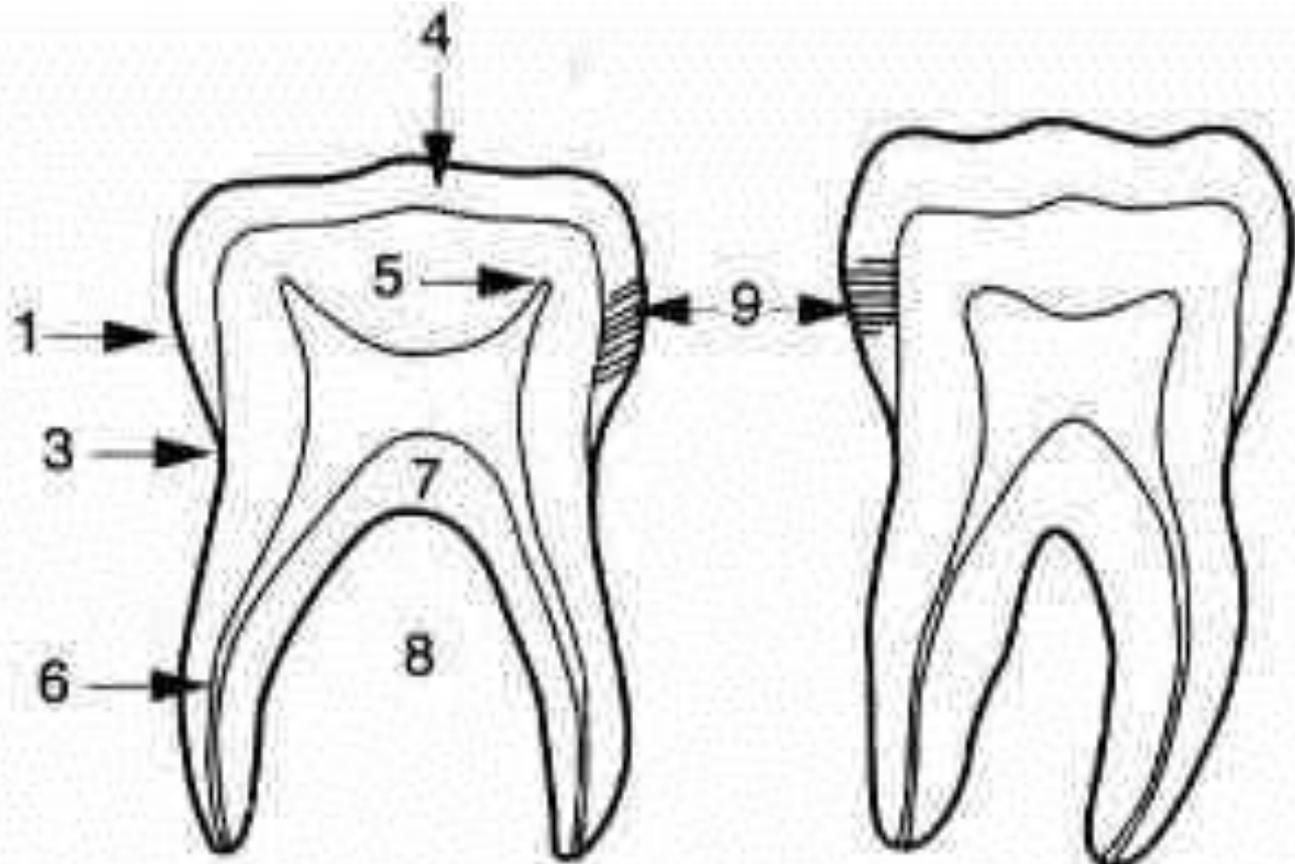
# Zahn- und Pulpaanatomie

**Dr. Zsuzsanna Tóth Ph.D.**

**Semmelweis University**

**Klinik für Zahnerhaltung**

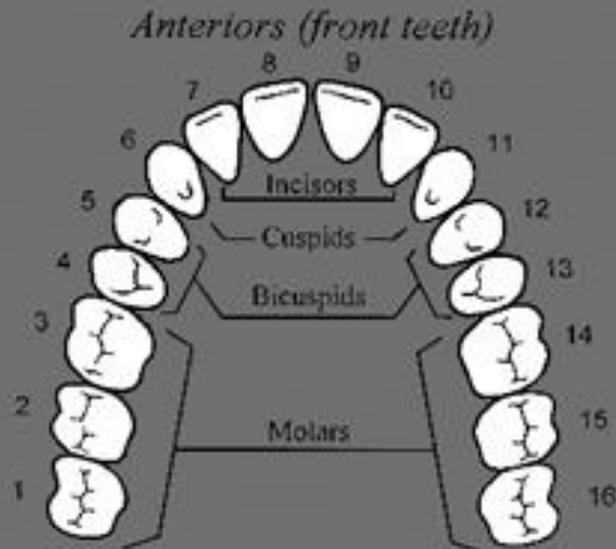




Milchzahn

Bleibender Zahn

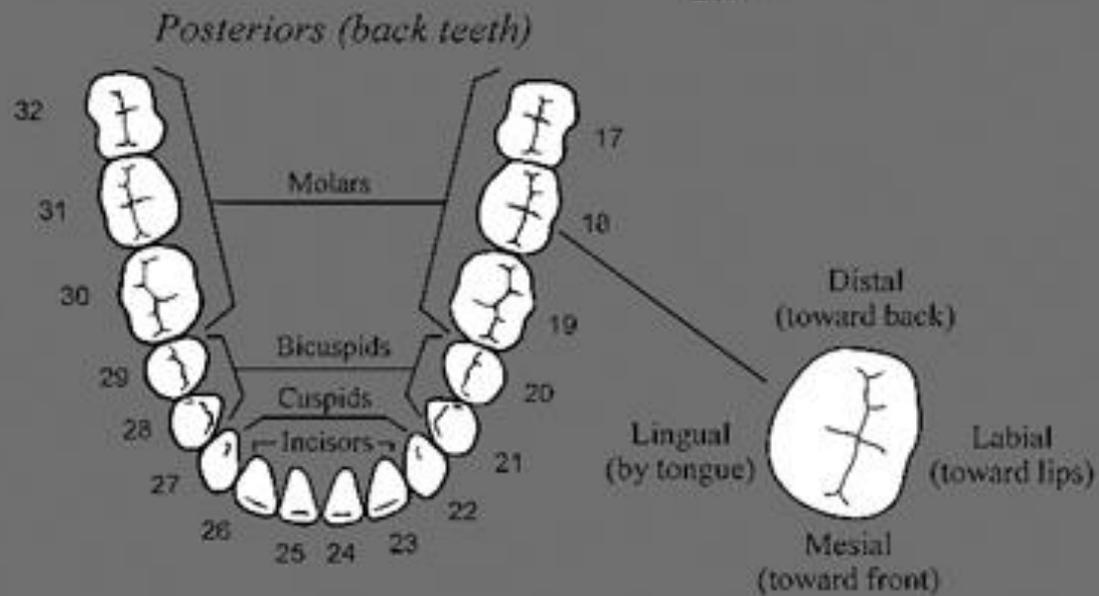
Uppers  
(maxillary)



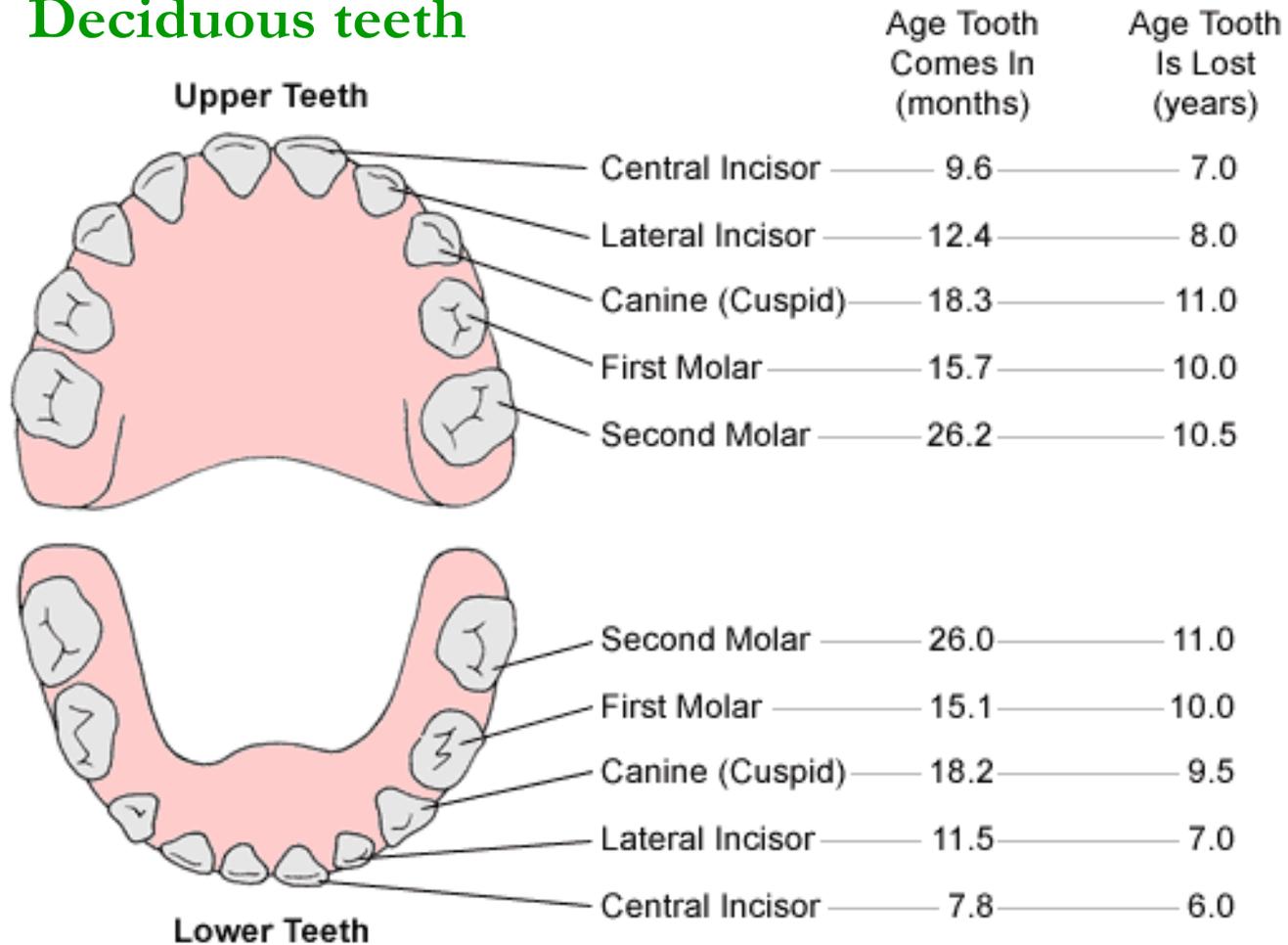
Right

Left

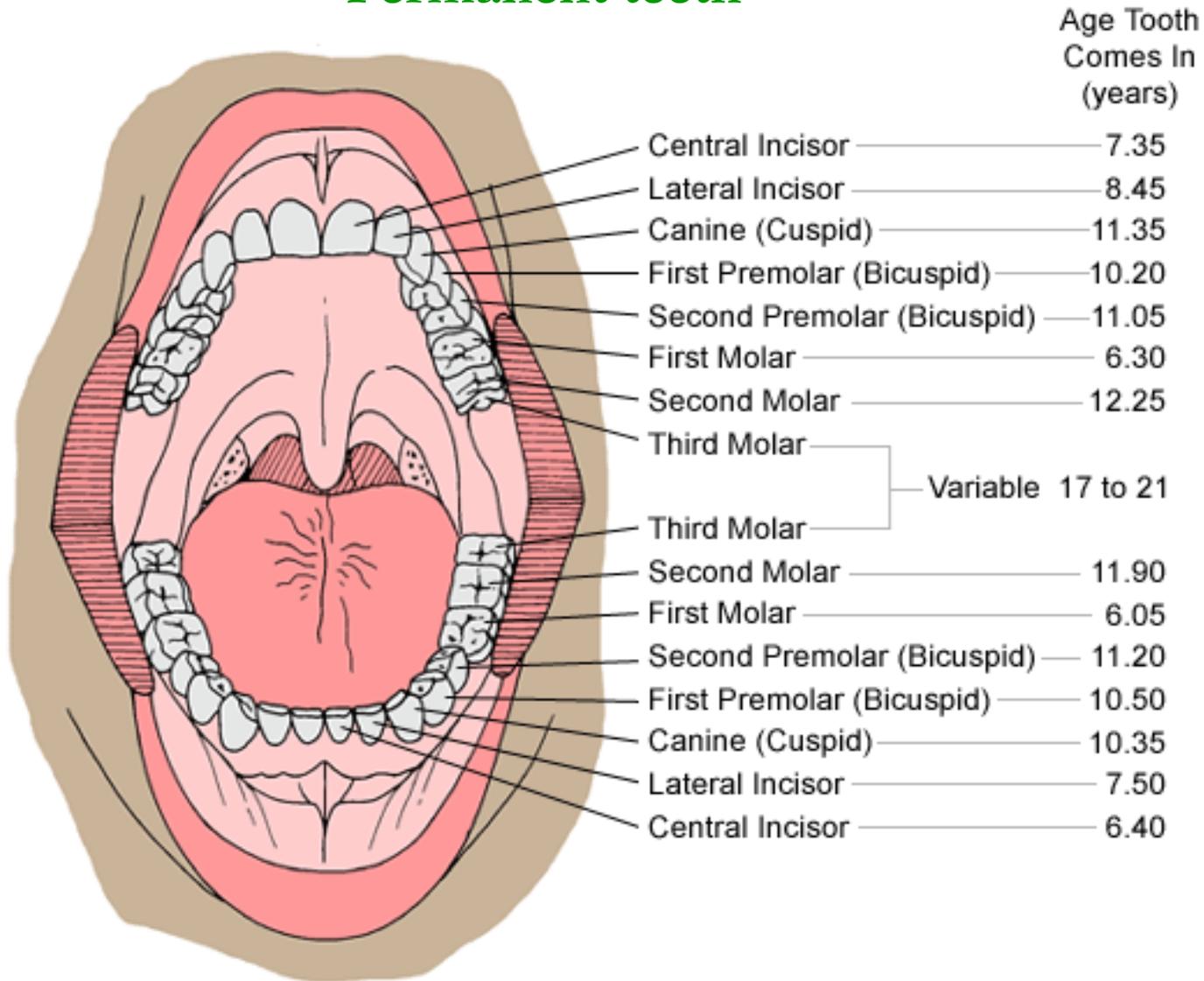
Lowers  
(mandibular)

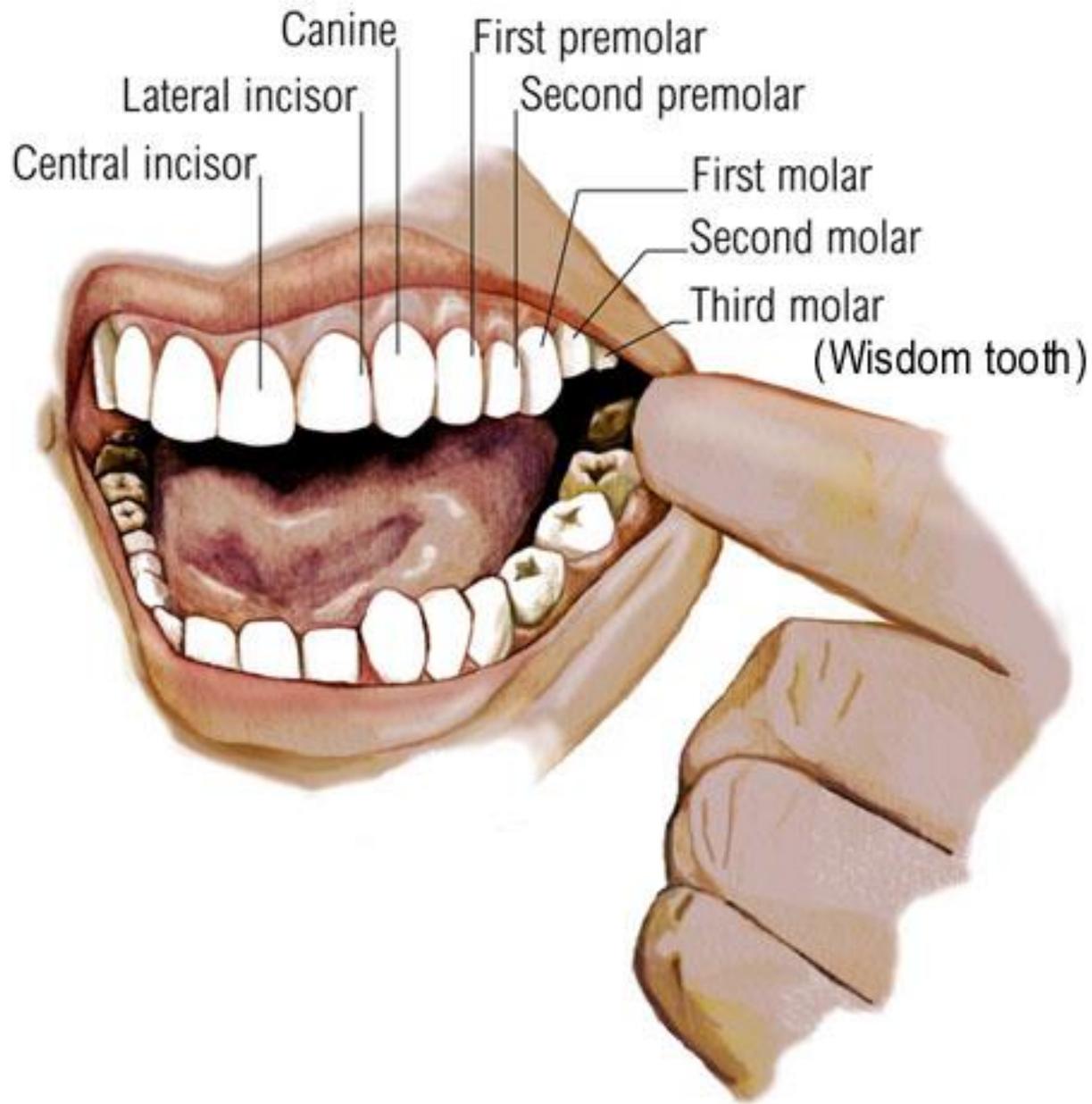


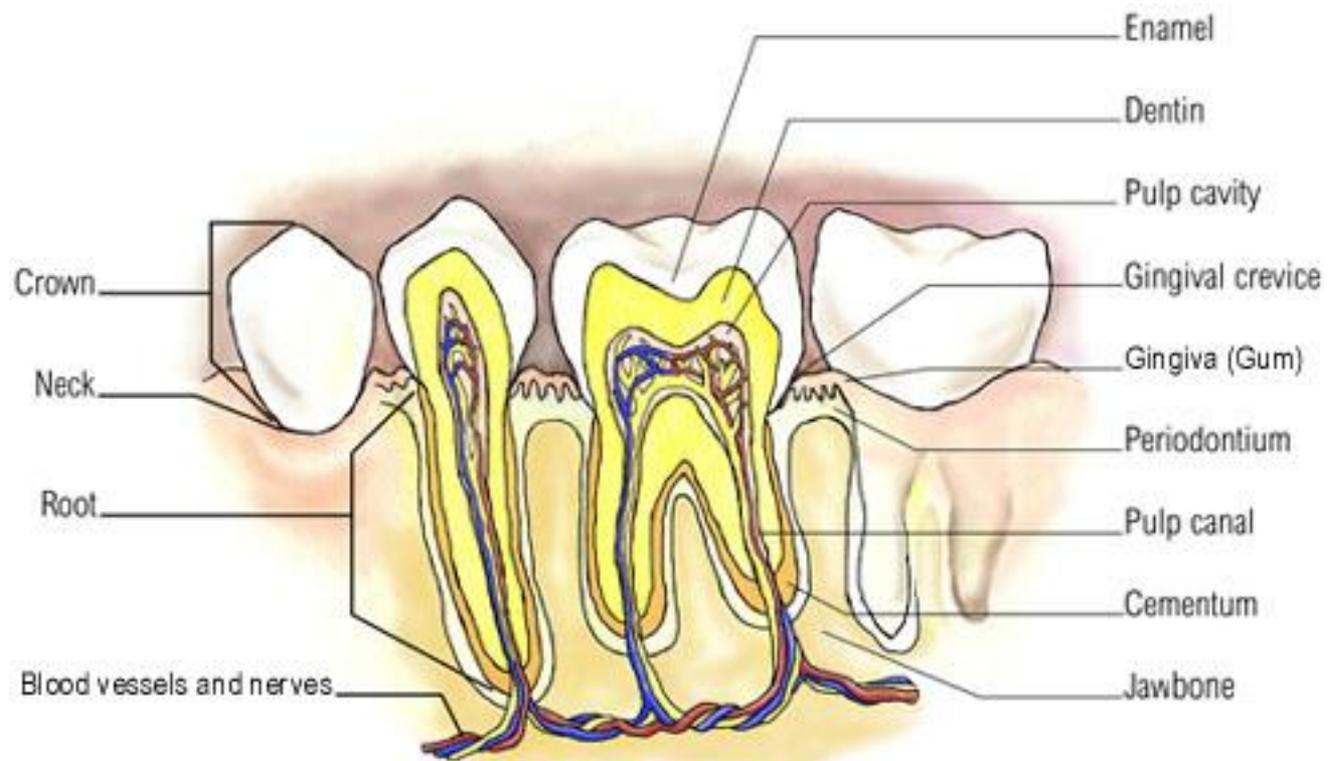
## Deciduous teeth

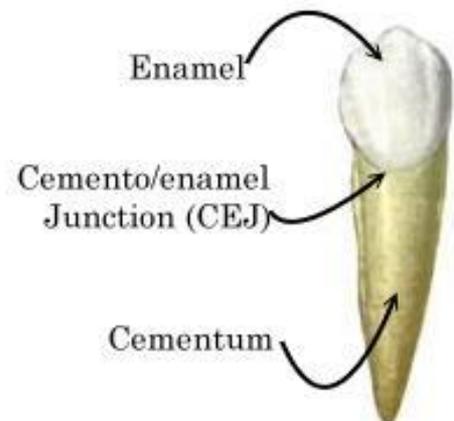
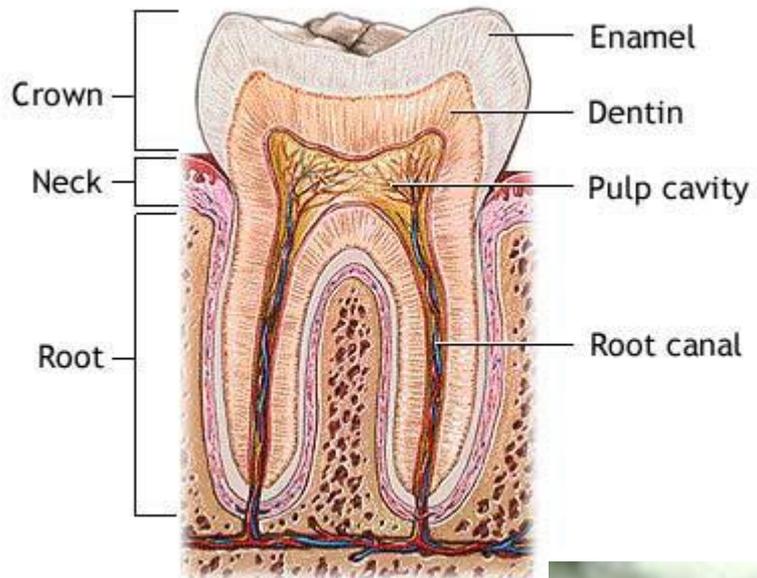


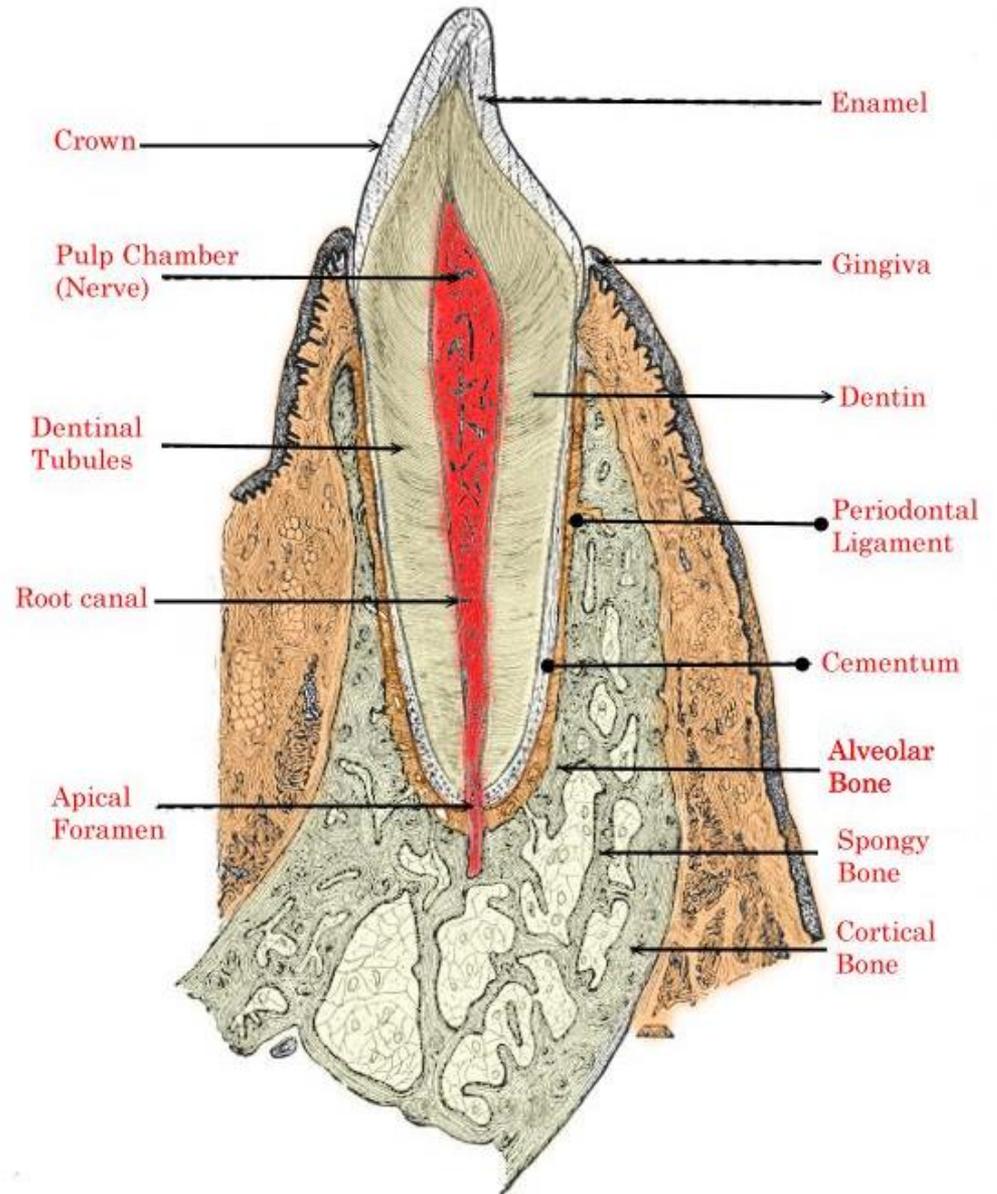
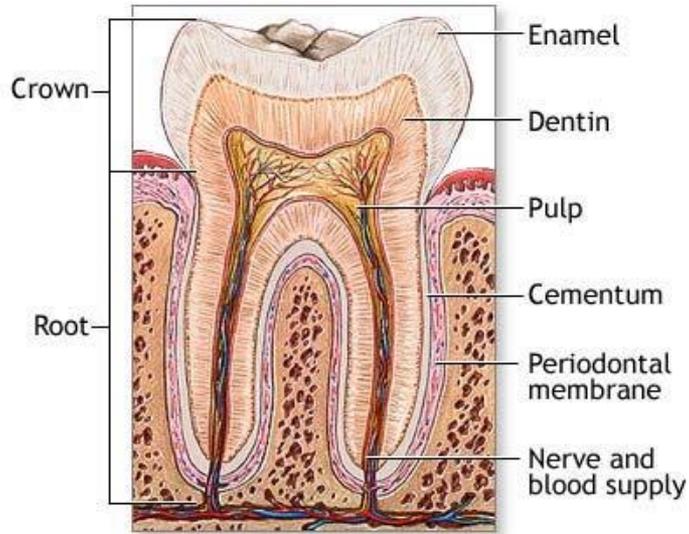
## Permanent teeth

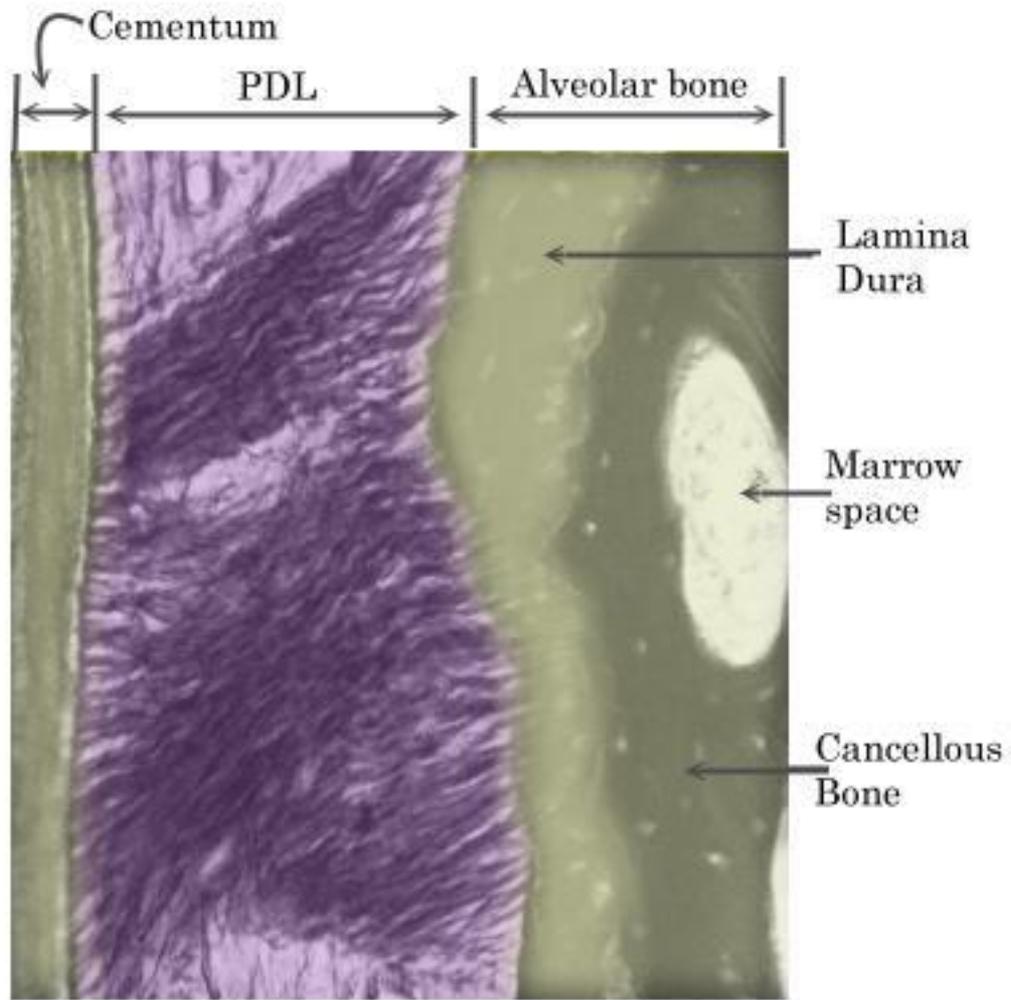


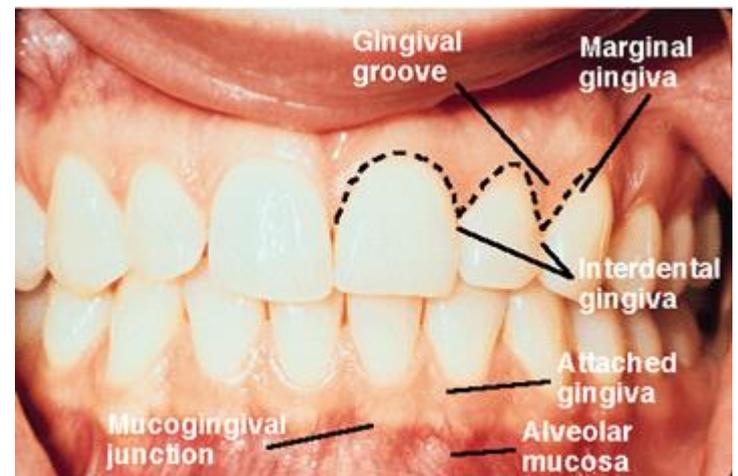
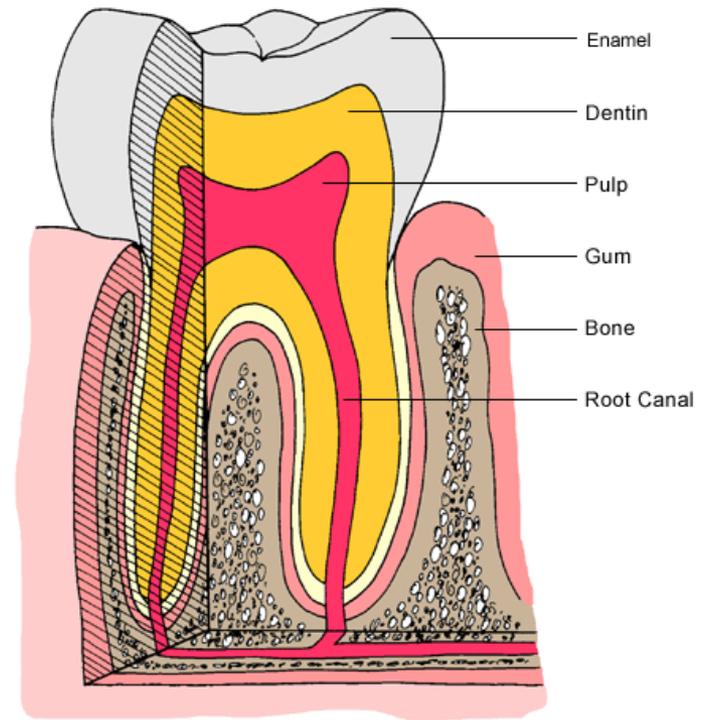
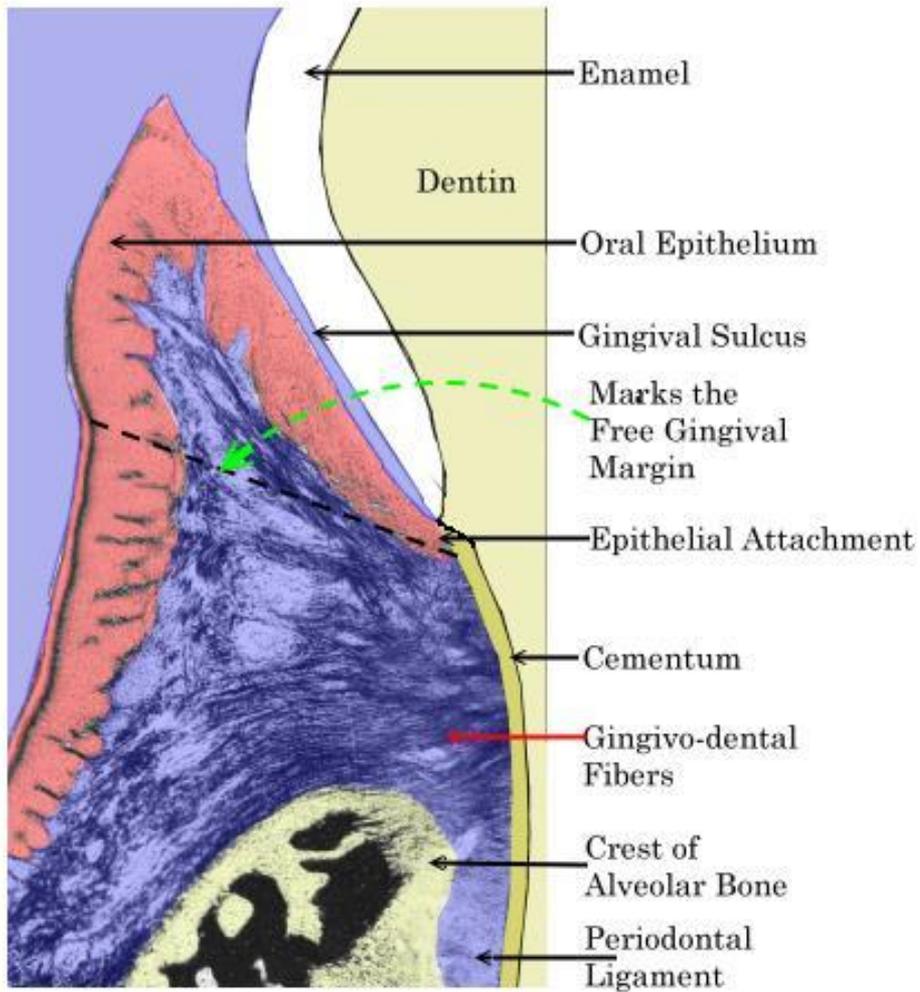


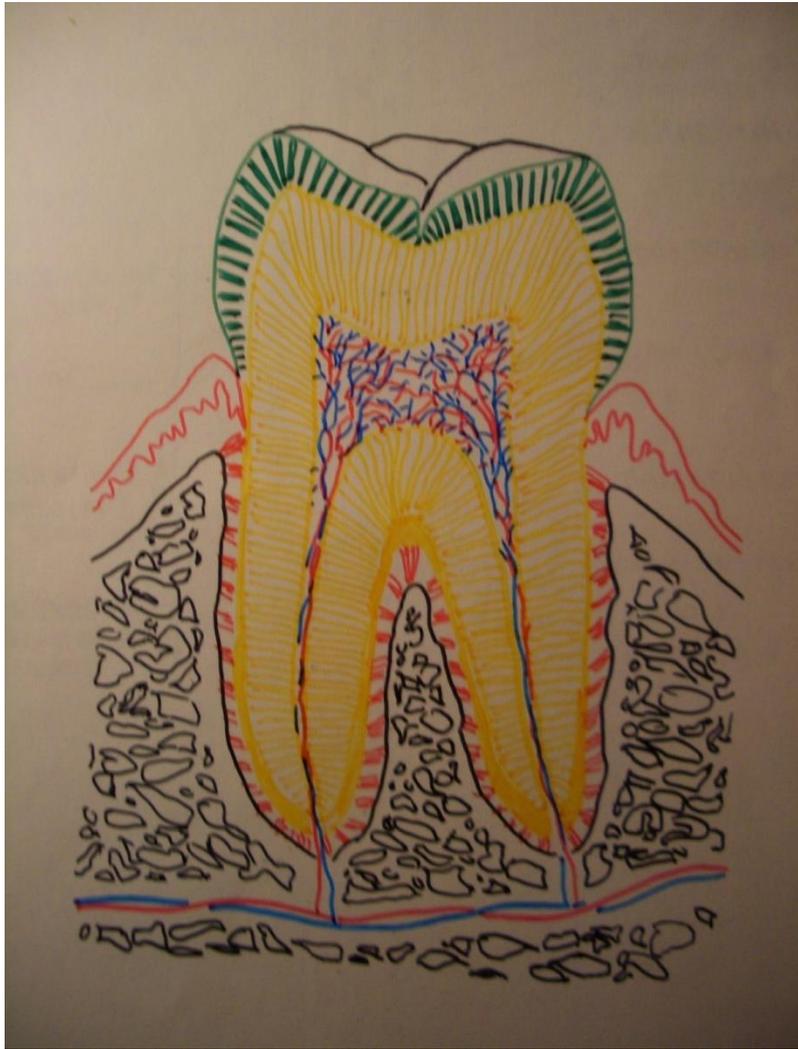


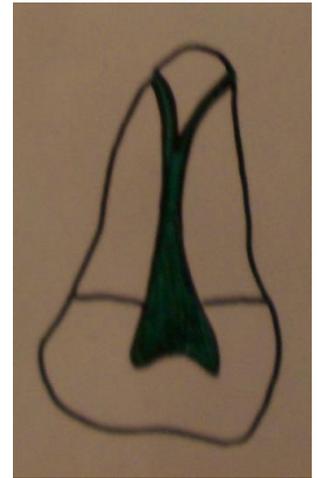
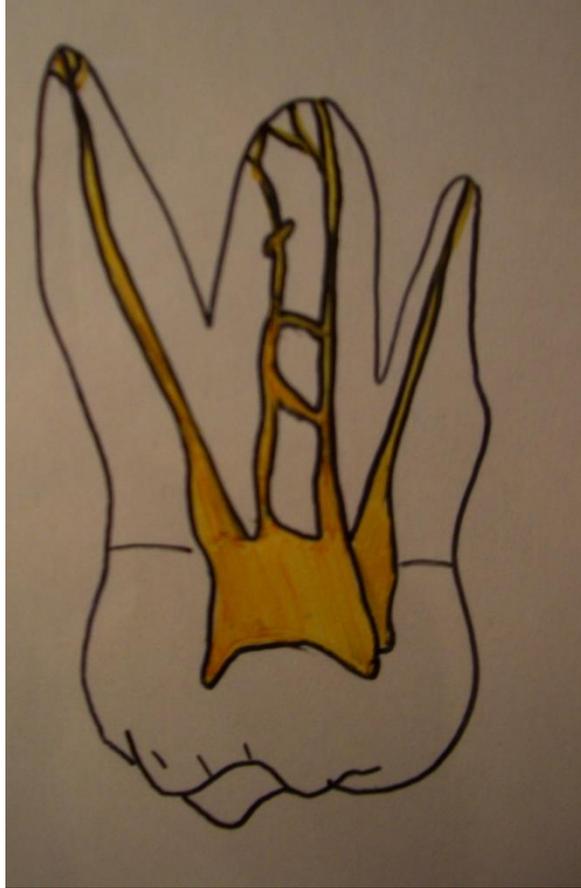
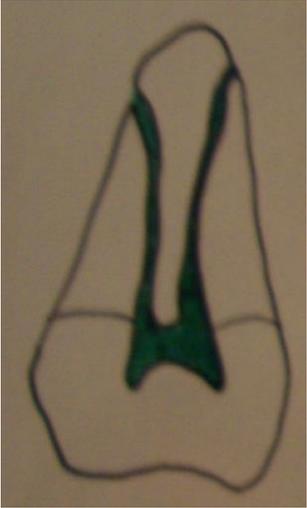


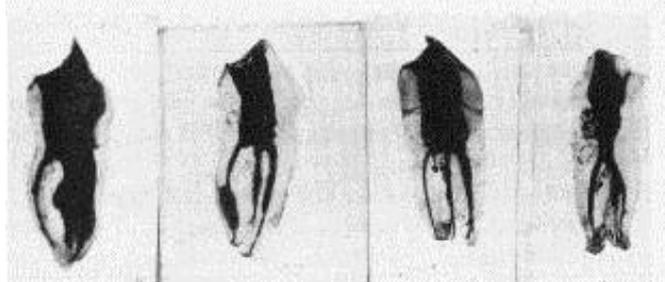
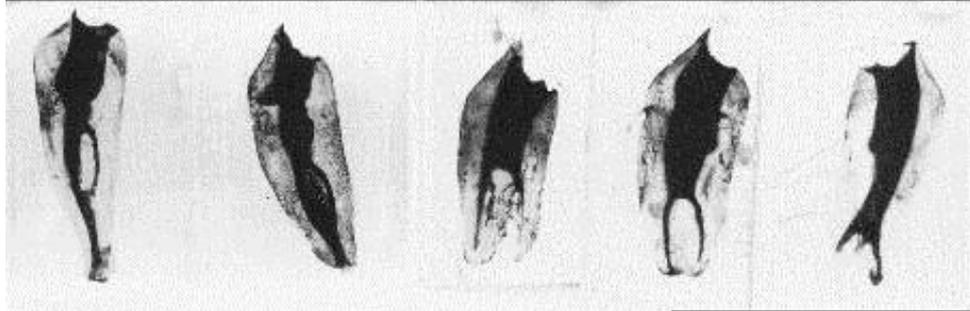
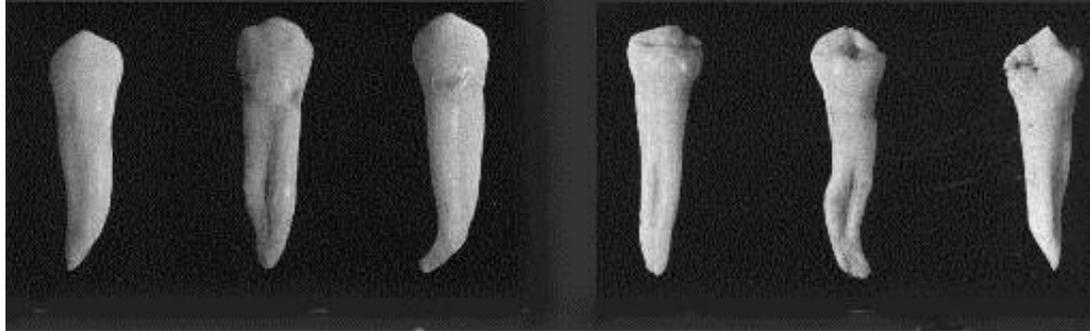
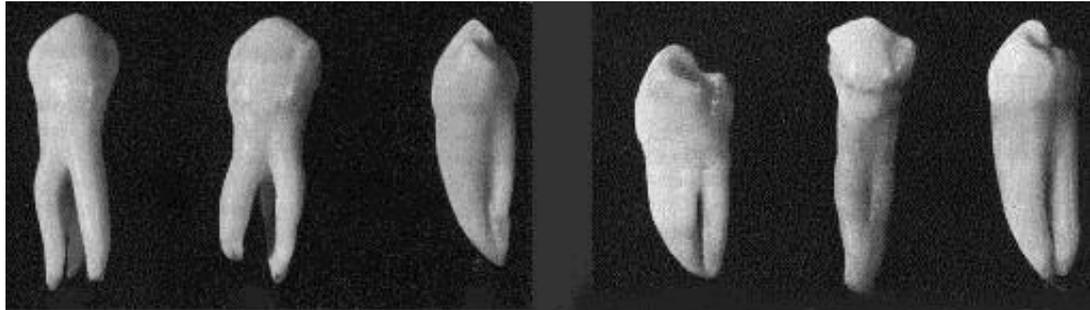




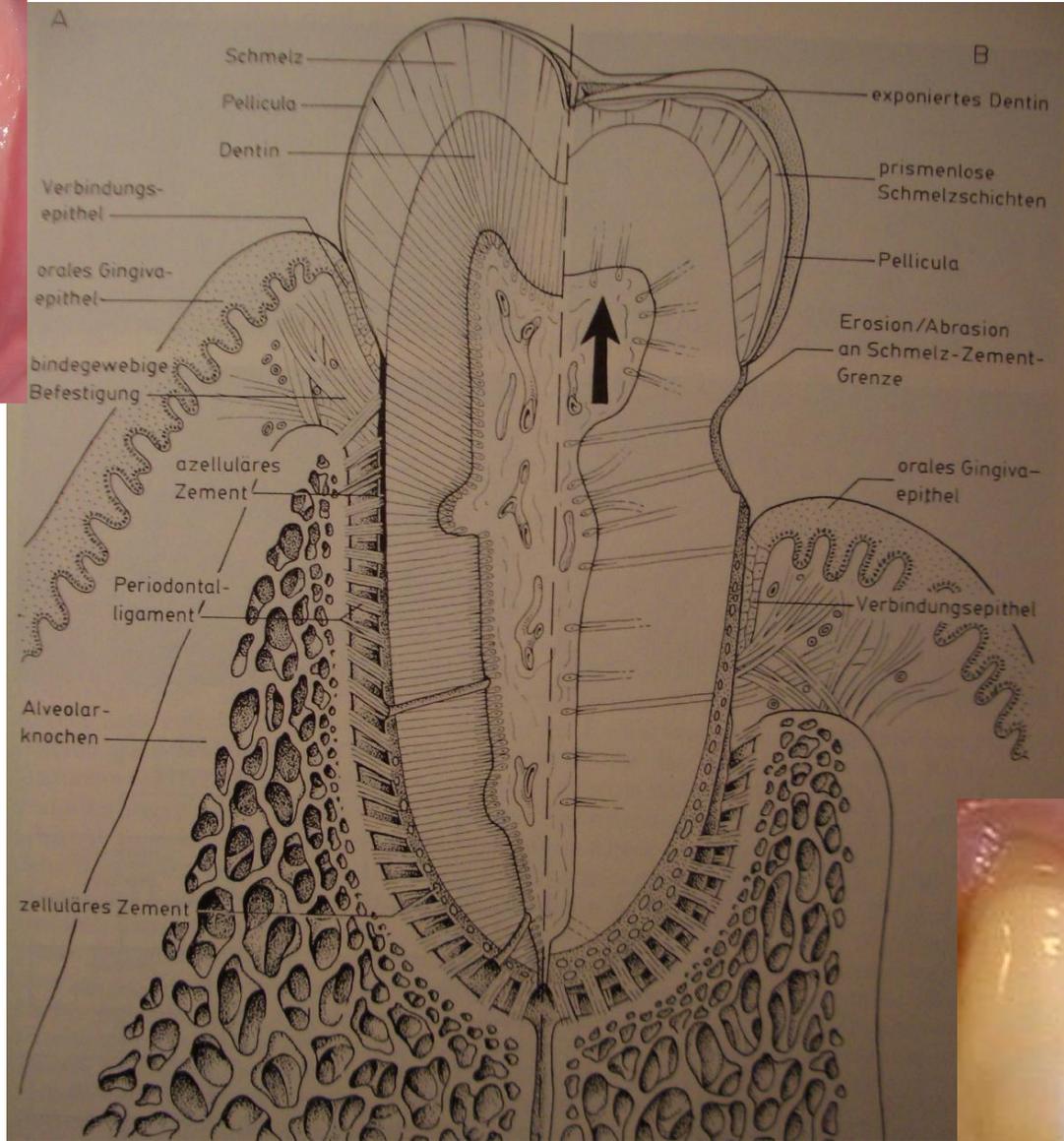


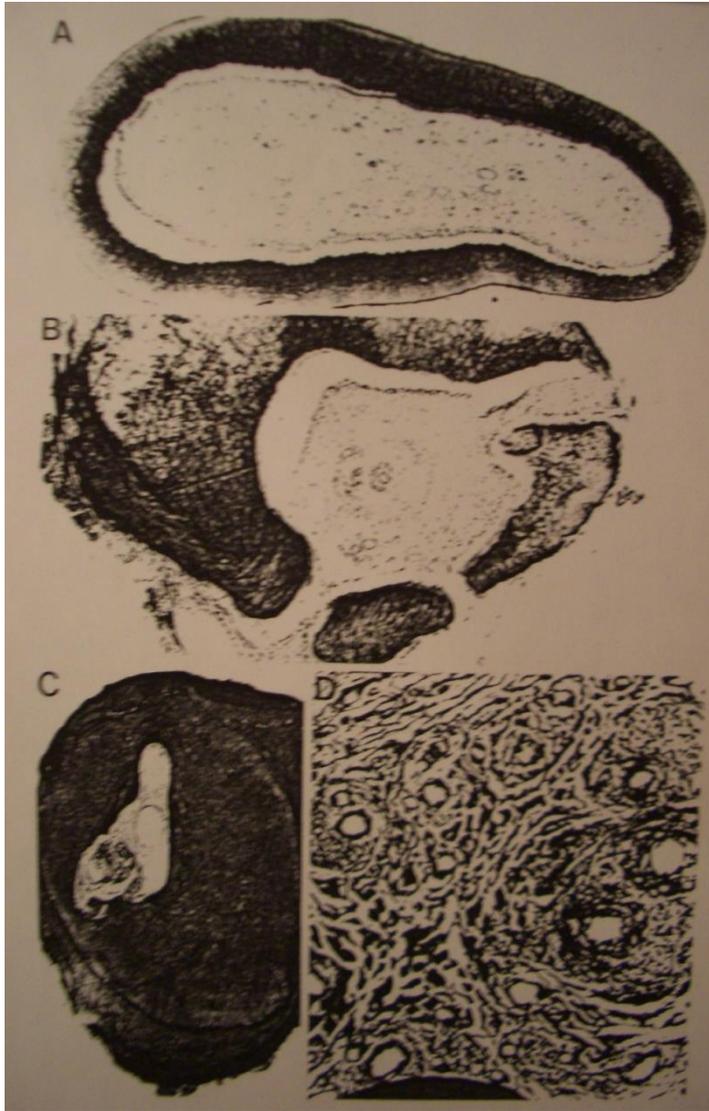


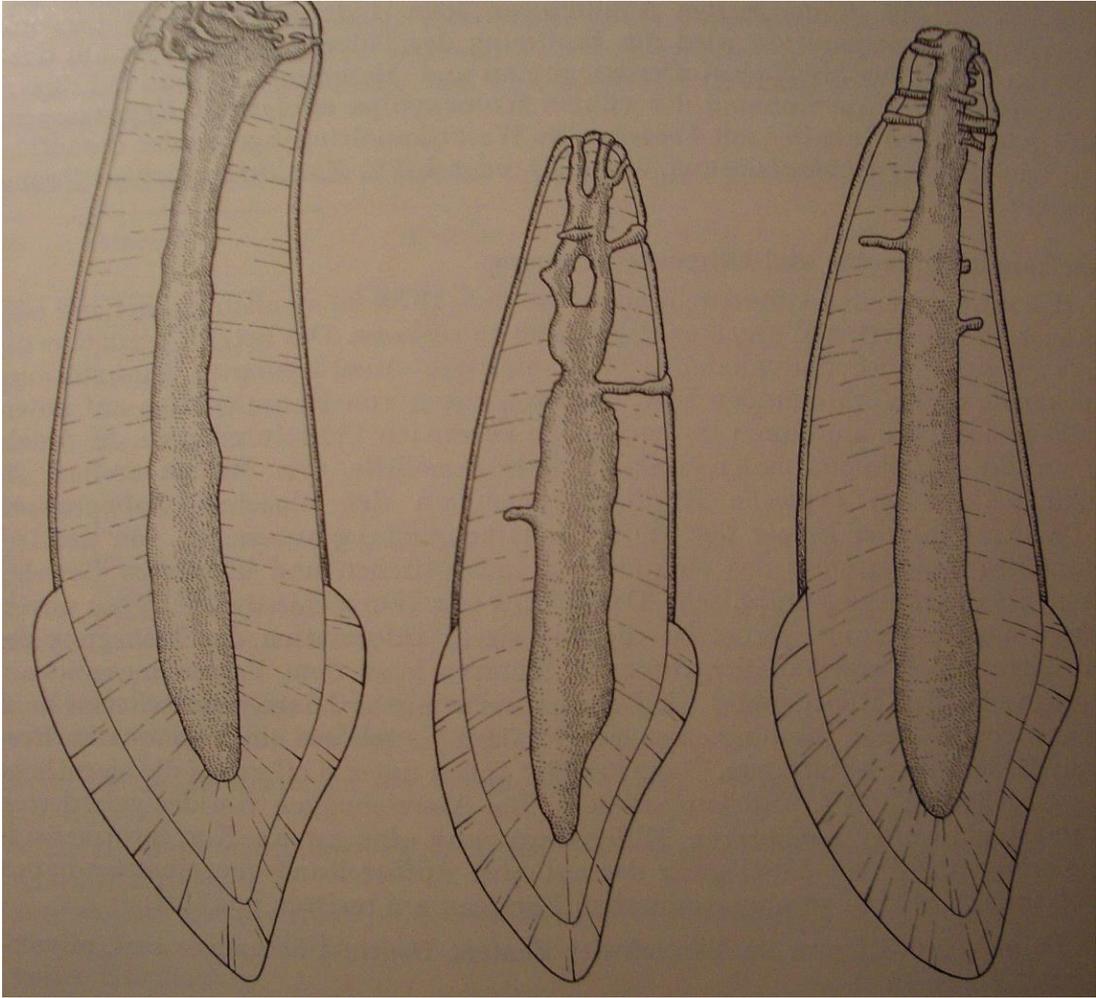




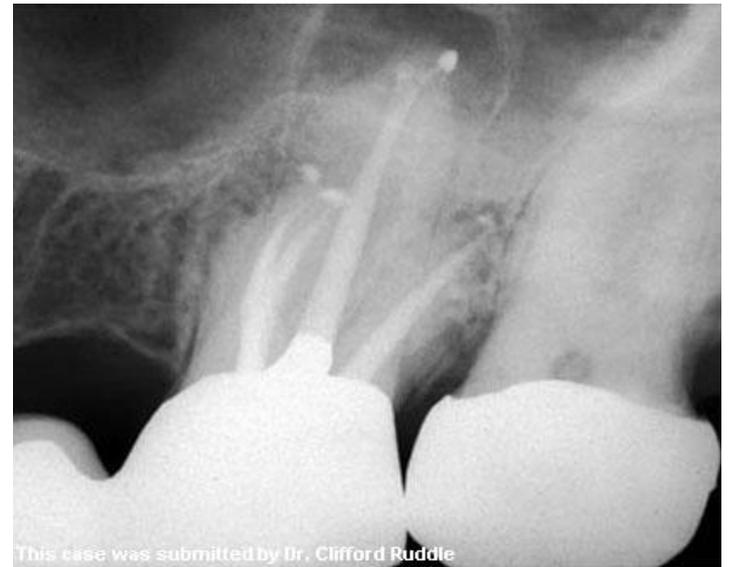
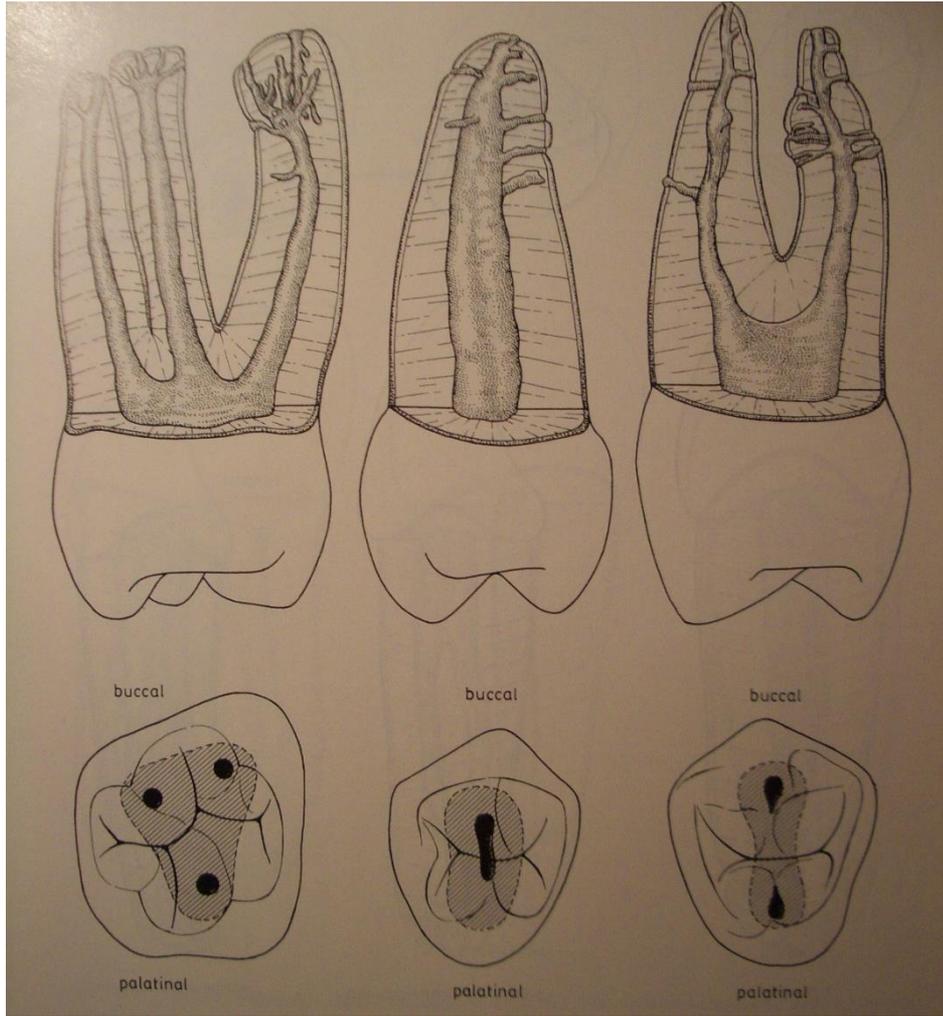








This case was submitted by Dr. Giuseppe Cantatore



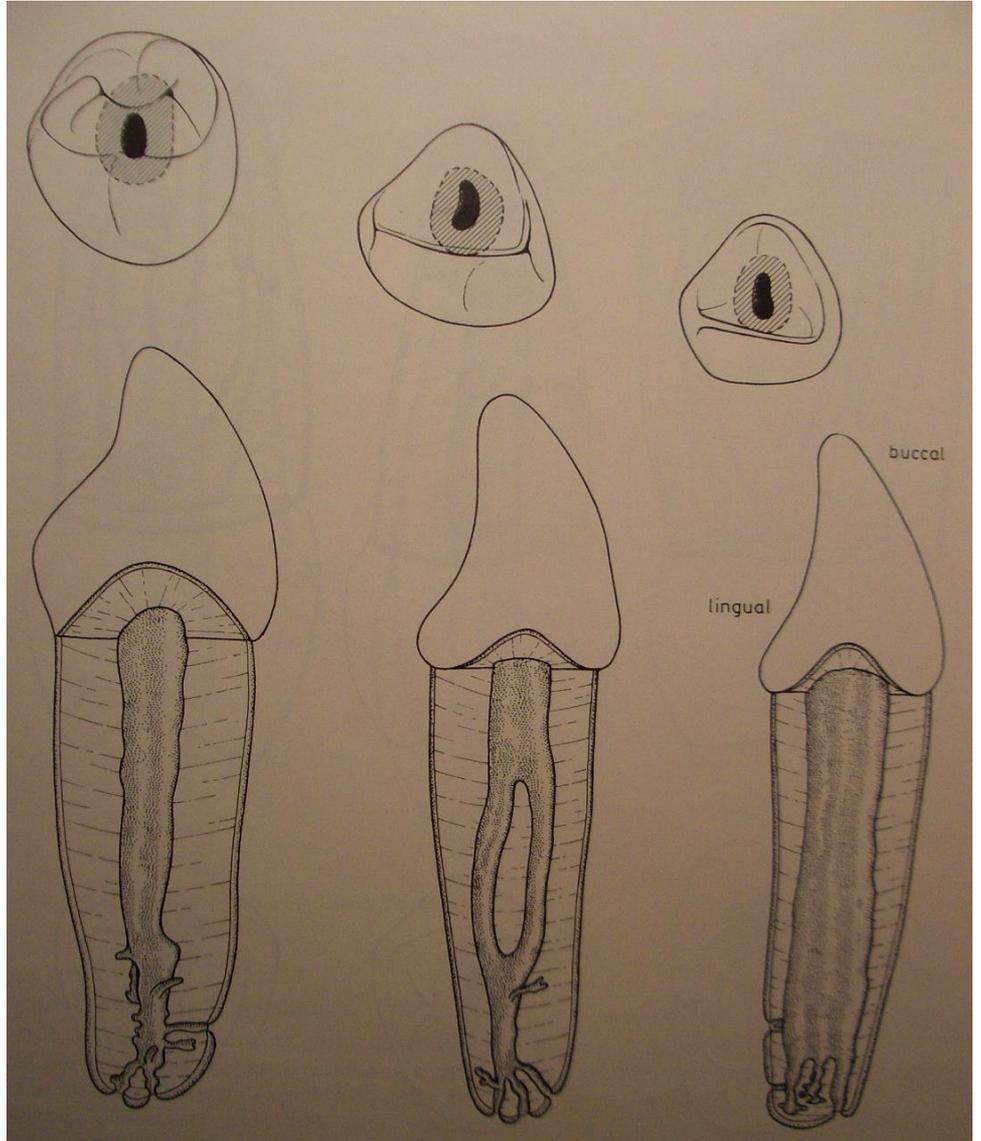
This case was submitted by Dr. Clifford Ruddle

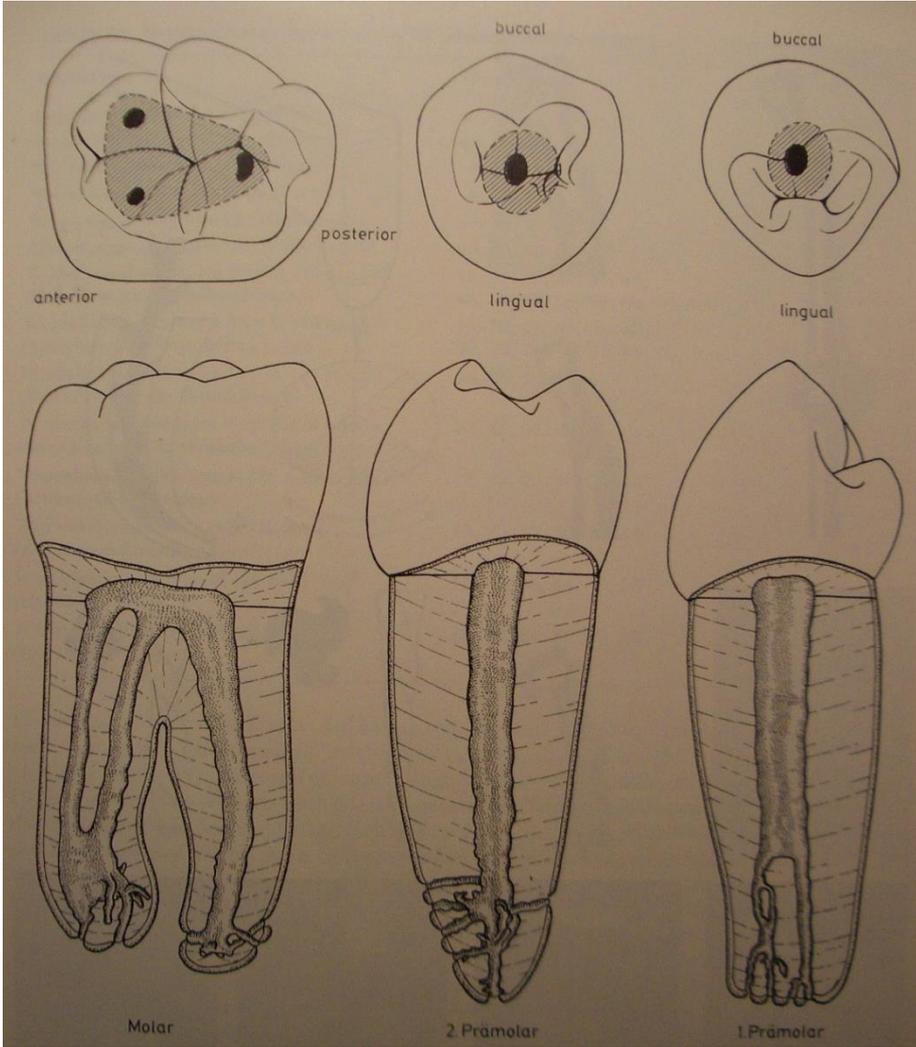
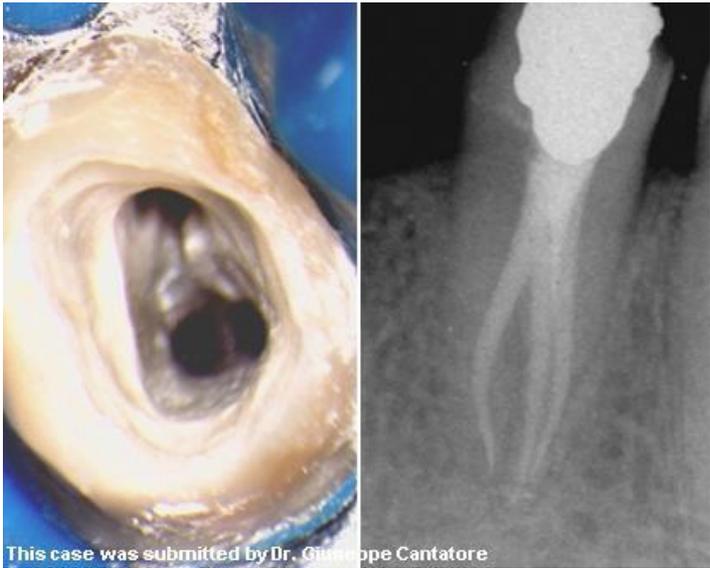


This case was submitted by Dr. David Hatcher



This case was submitted by Dr. Clifford Ruddle







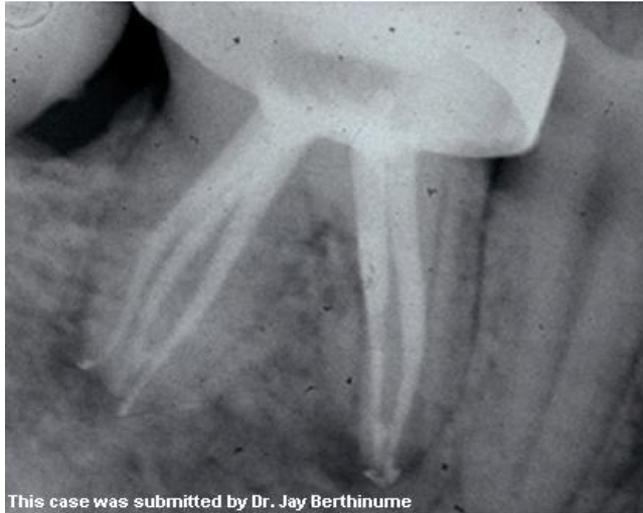
This case was submitted by Dr. Clifford Ruddle



This case was submitted by Dr. Bruce Fogel



This case was submitted by Dr. Richard Rubinstein



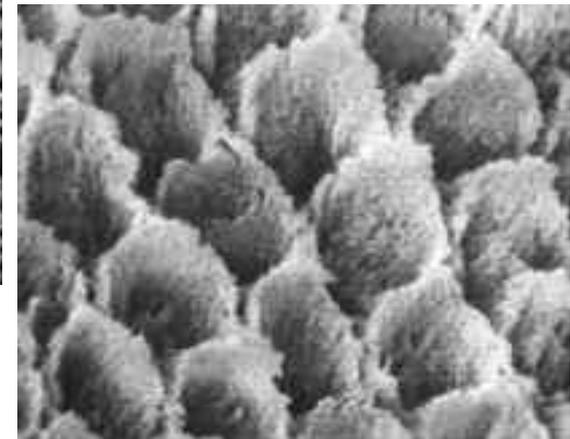
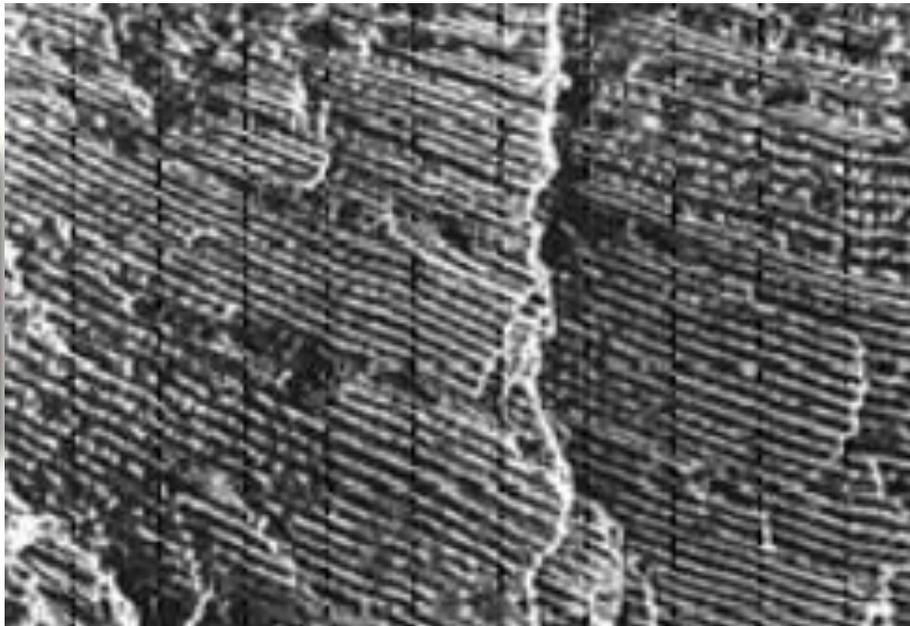
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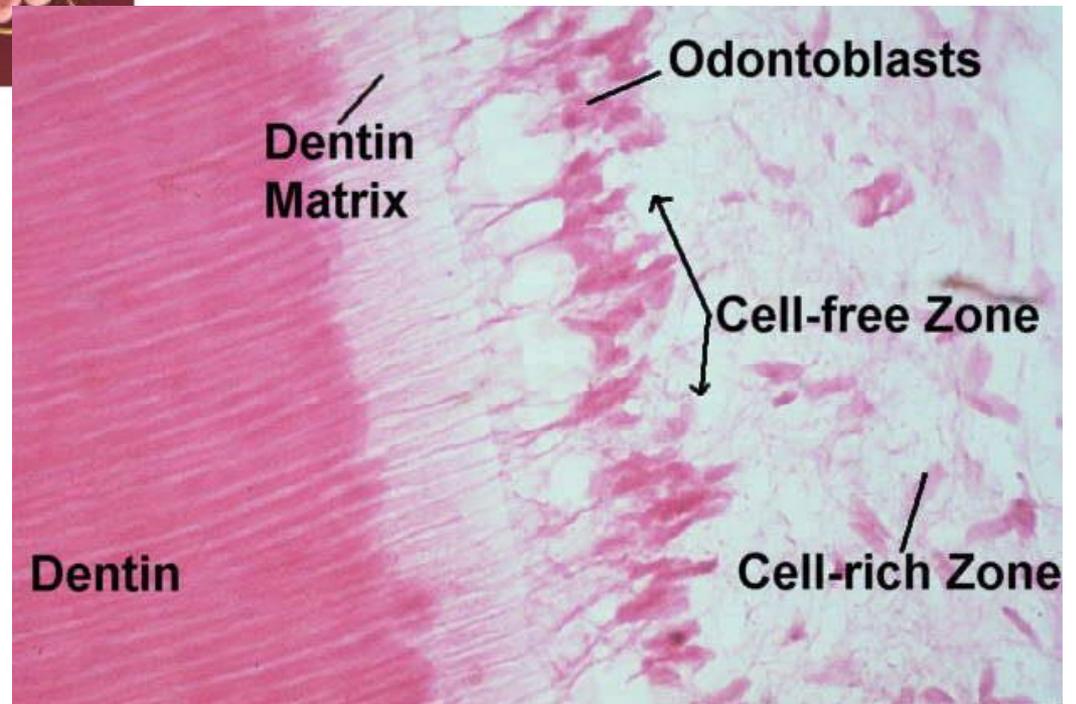
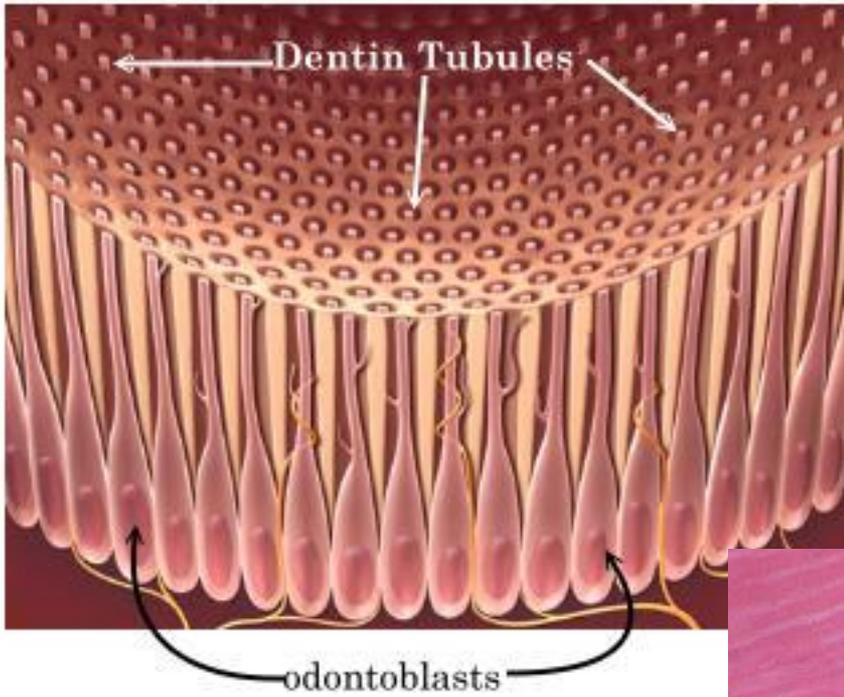
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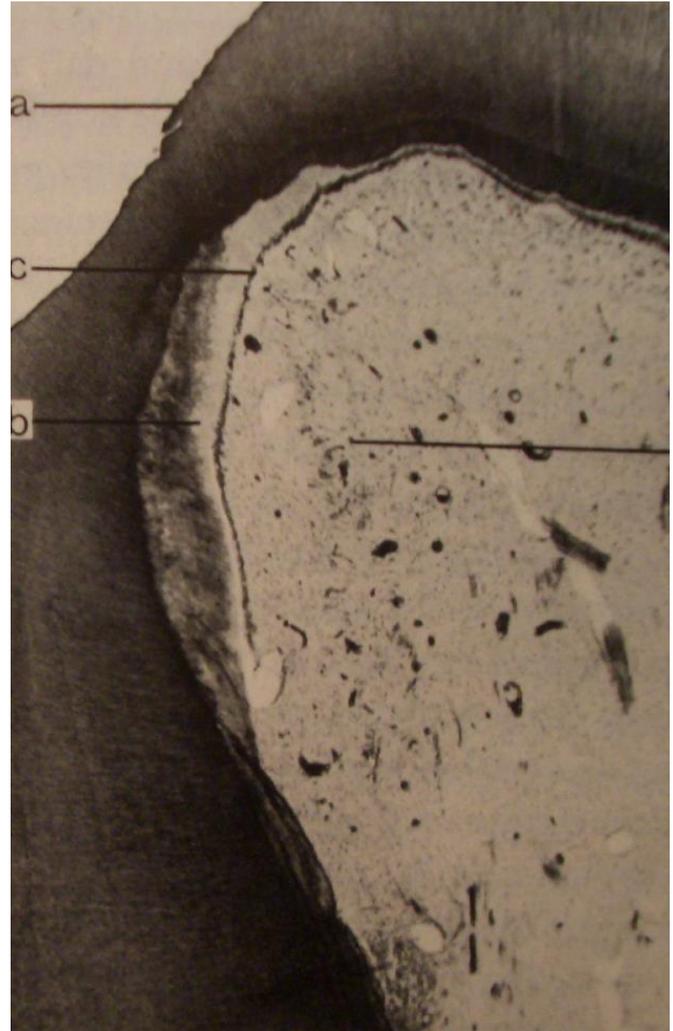


Human enamel



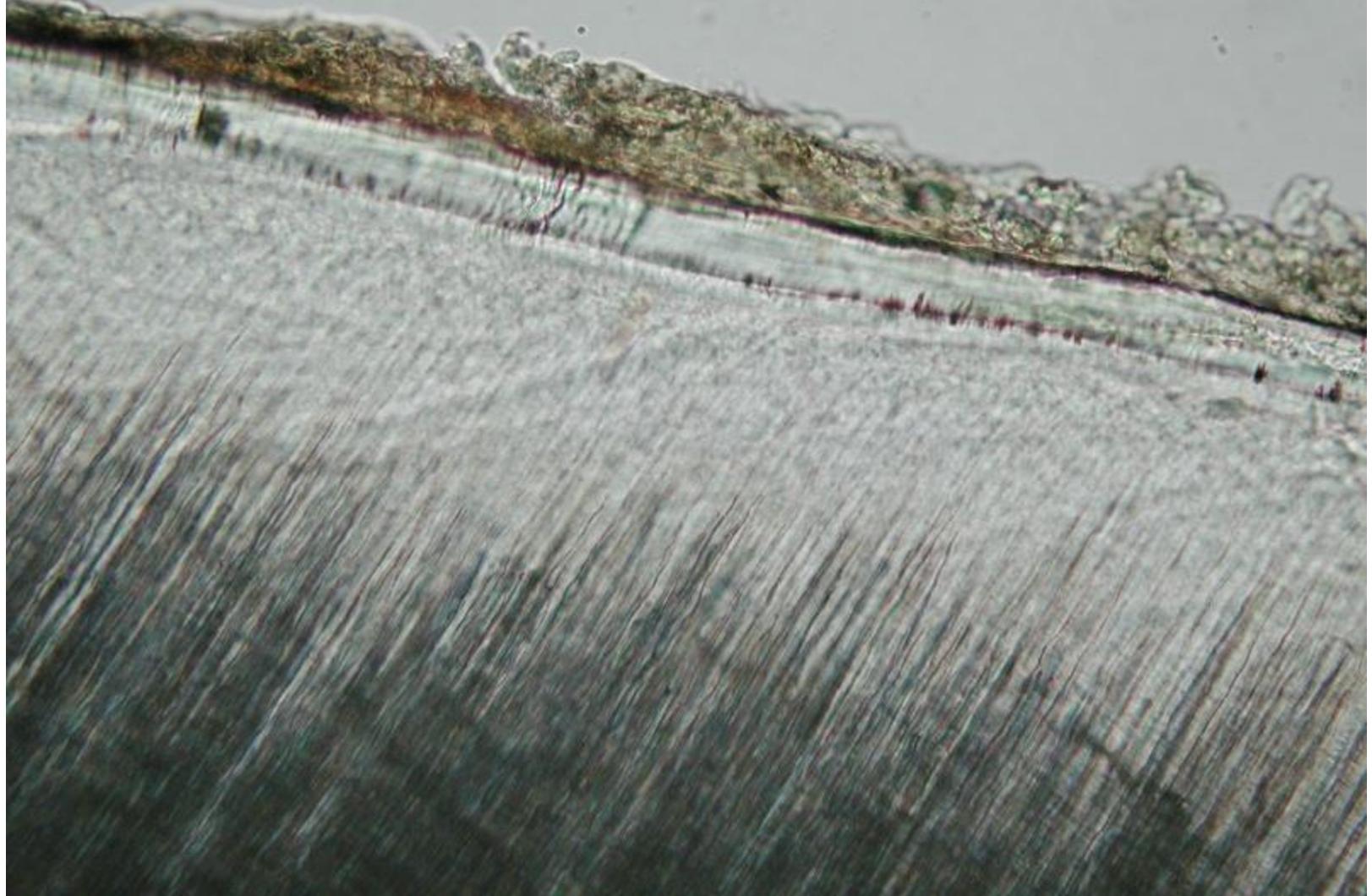








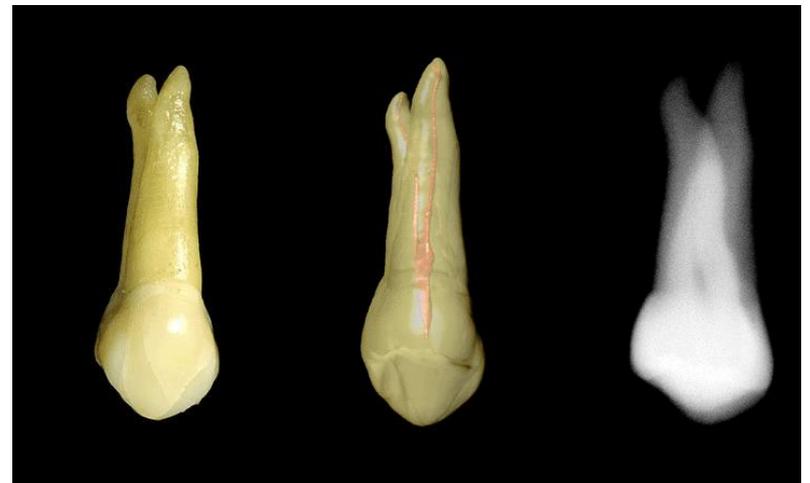
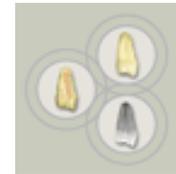
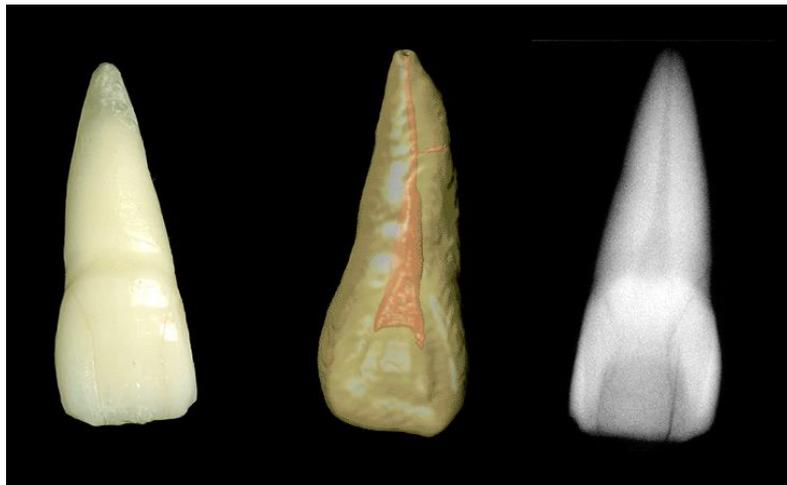
Department of Histology ©  
Jagiellonian University, Medical College



# Brown & Herbranson

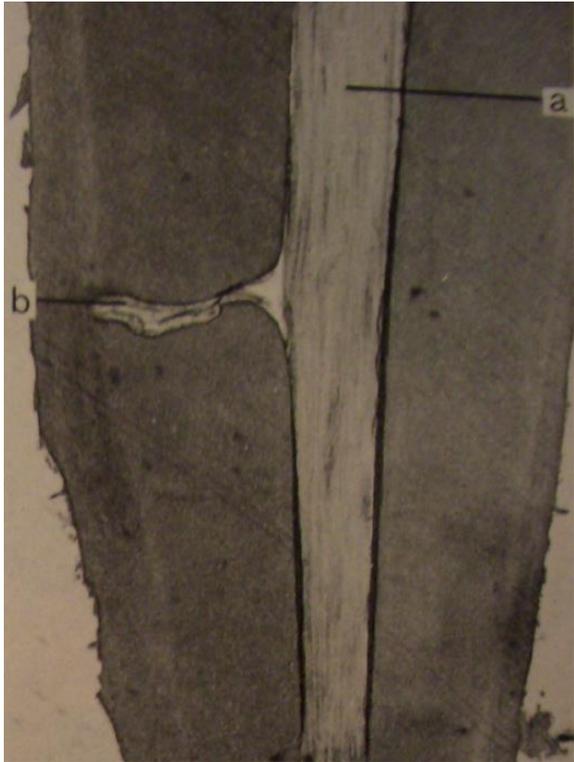


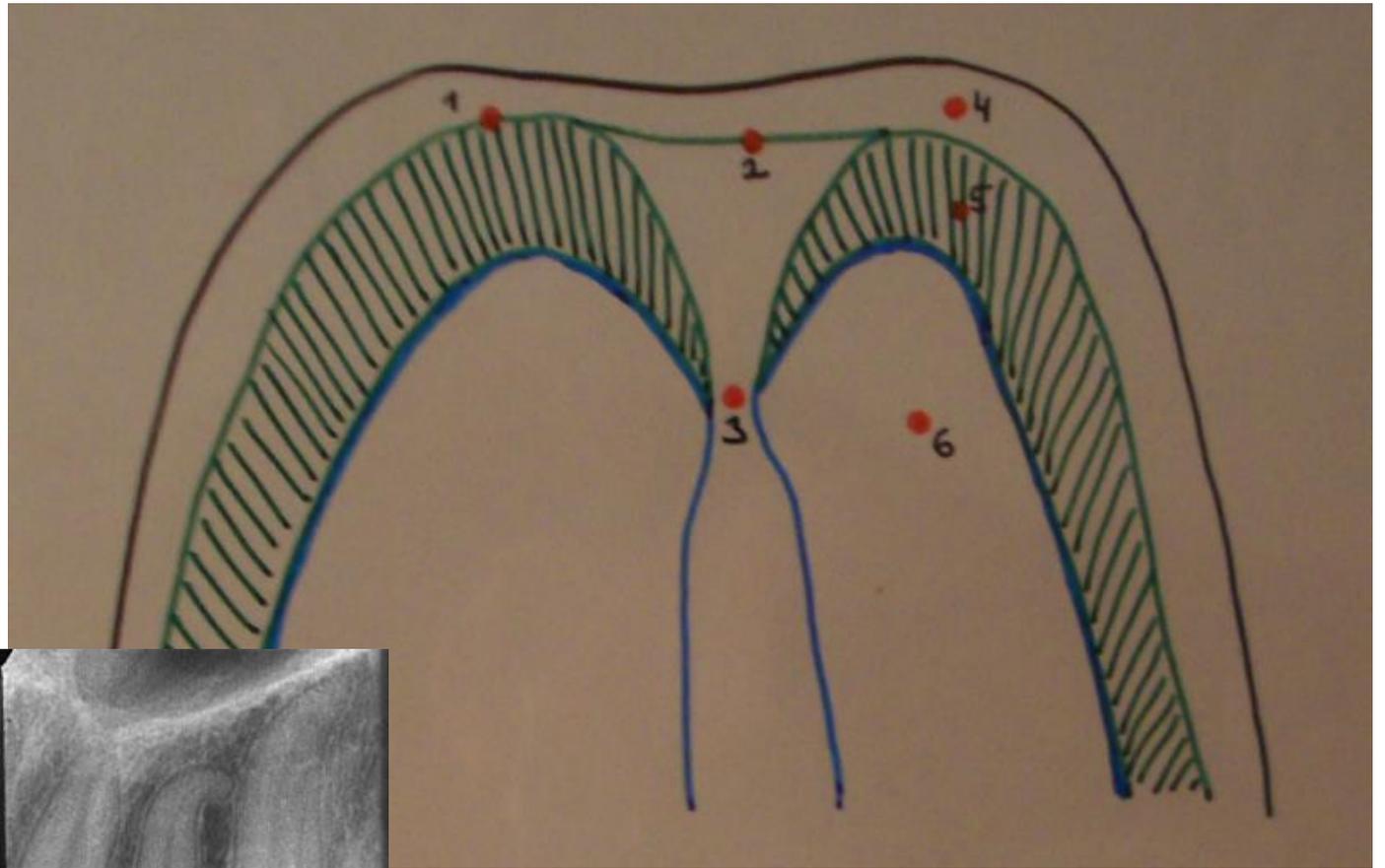
## Dental Anatomy & Interactive 3-D Tooth ATLAS



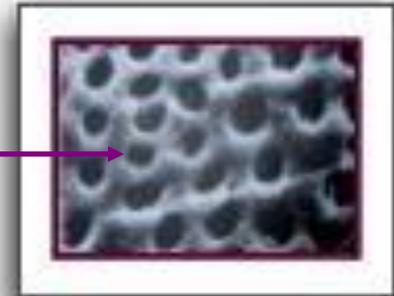
[www.toothatlas.com](http://www.toothatlas.com)





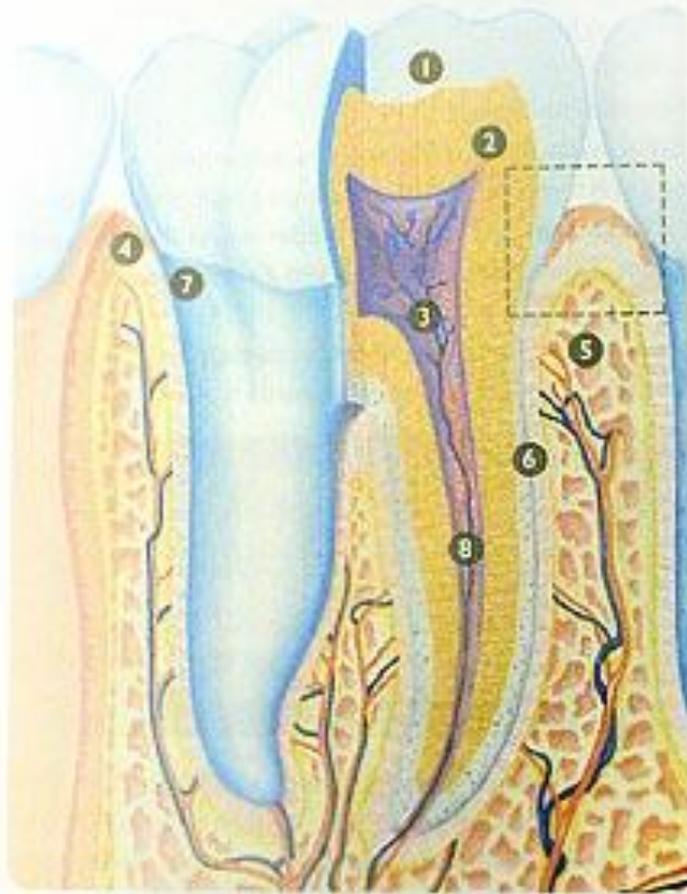


This case was submitted by Dr. David Hatcher



# PULPAMORPHOLOGIE

Gesunder Mahl Zahn im Schnitt



1. Zahnschmelz
2. Zahnbein (Dentin)
3. Zahnerv (Pulpa)
4. Zahnfleisch (Gingiva)
5. Kieferknochen
6. Zahnhalteapparat
7. Zahazement
8. Nerven und Blutgefäße

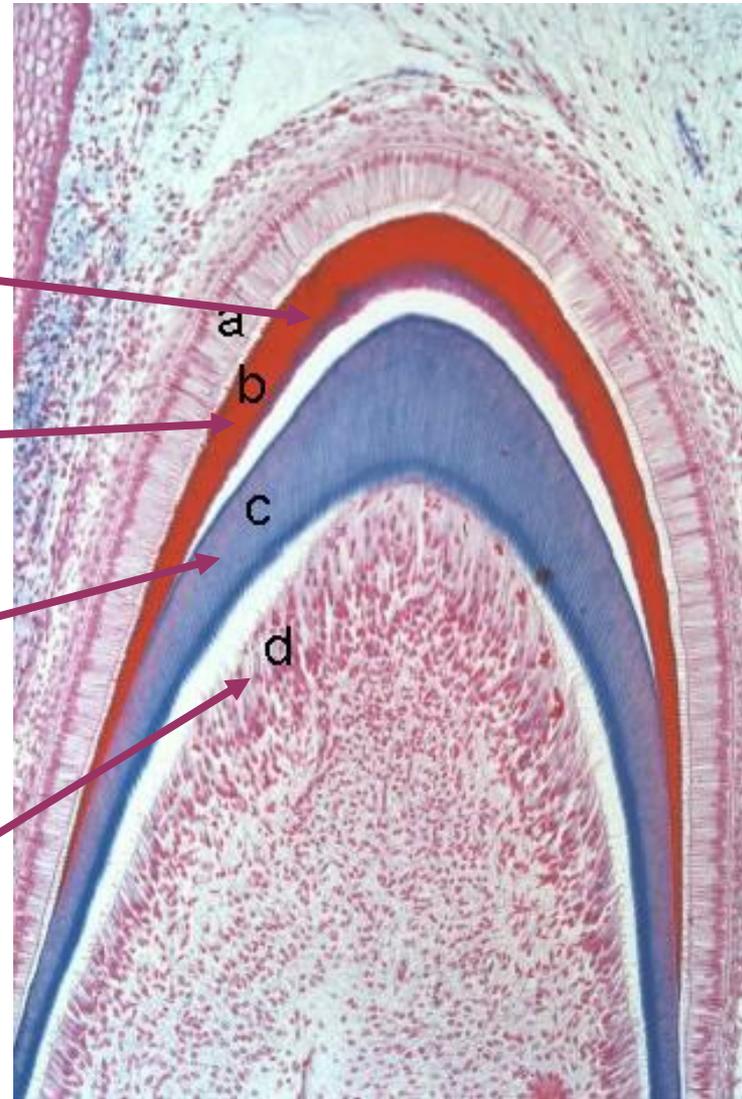


**Ameloblasten**

**Schmelz**

**Dentin**

**Odontoblasten**





# PULPA

## Aufgaben:

- Ernährung des Zahnes
- Abwehr von Erregern
- Innervation des Zahnes
- Dentinbildung



# PULPAGEWEBE

**Lockerer, spezialisiertes Bindegewebe:**

- **Zellen einer interzellulären Grundsubstanz**
- **Retikuläre, kollagene Fibrillen, Fasern**
- **Gefäße**
- **Nerven**

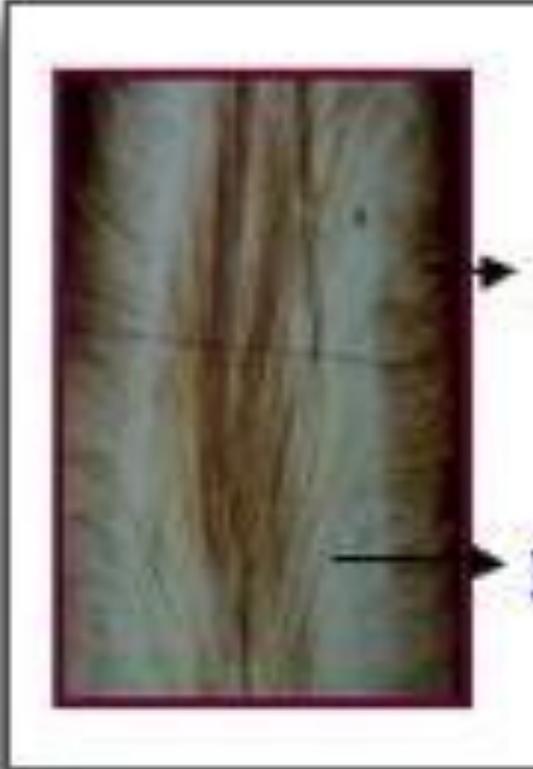
# PULPAGEWEBE



## **gallertiges Bindegewebe**

- **homogene Grundsubstanz**
- **zahlreiche aktive Fibroblasten (große, helle und ovale Kerne) in netzförmiger Anordnung**
- **sehr wenige retikuläre und (dünne) kollagene Fasern**
- **zahlreiche freie Zellen**
- **randständiger Odontoblastenverband (epithelartig; ein bis sechs Reihen)**
  
- **Gefäßplexus (weite dünne Gefäße)**
- **Nervenplexus (marklose Fasern, besonders unter den Odontoblasten)**

# DENTINBILDUNG



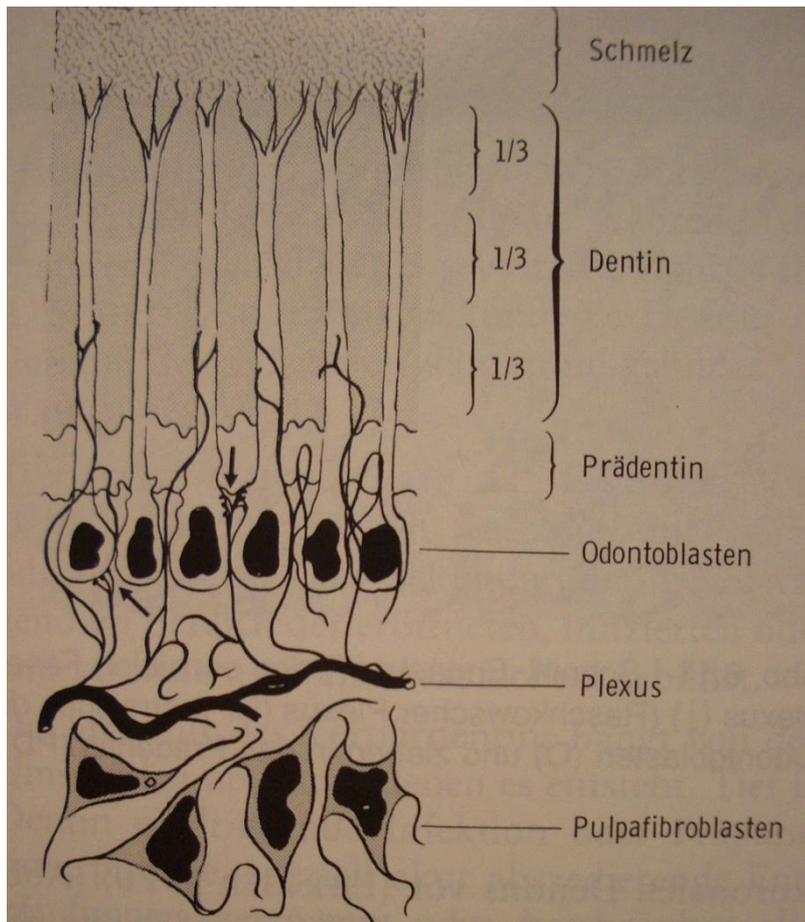
- **Primär**
- **Sekundär**
- **Tertiär**

# DENTINBILDUNG

- **Primär**
- **Secundär**
- **Tertiär**



# Innervationsmodell des menschlichen Zahnes



- Prädentinoberfläche
- Odontoblasten und Odontoblastenfortsätze
- Kernarme Zone (Weil)
- Kernreiche Zone
- Fibroblasten
- Ersatzzellen
- Abwehrzellen
- Fibrillen und Fasern
- Gefäße
- Nervenfasern (Eifinger)

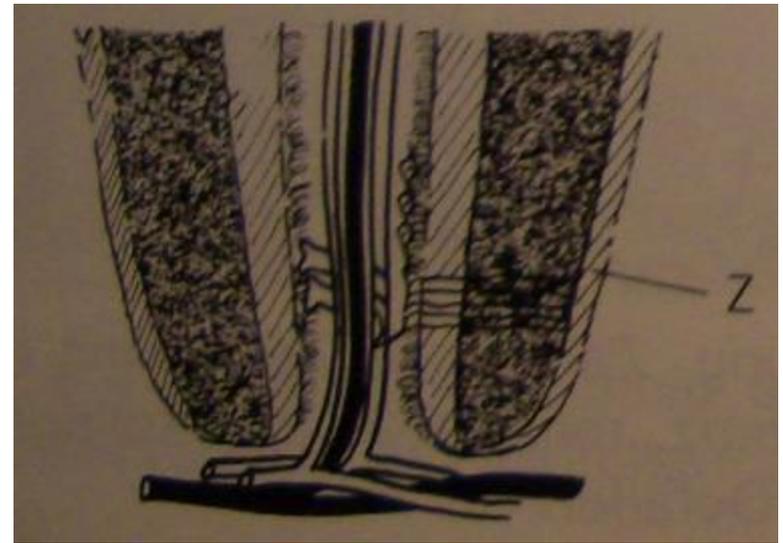
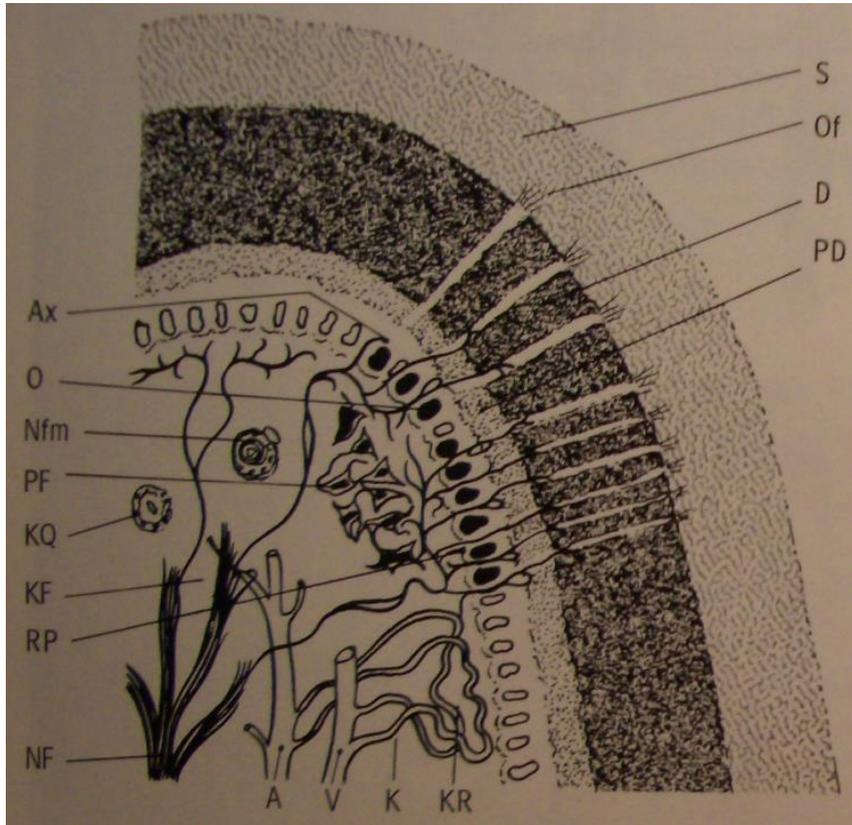
# ODONTOBLASTEN

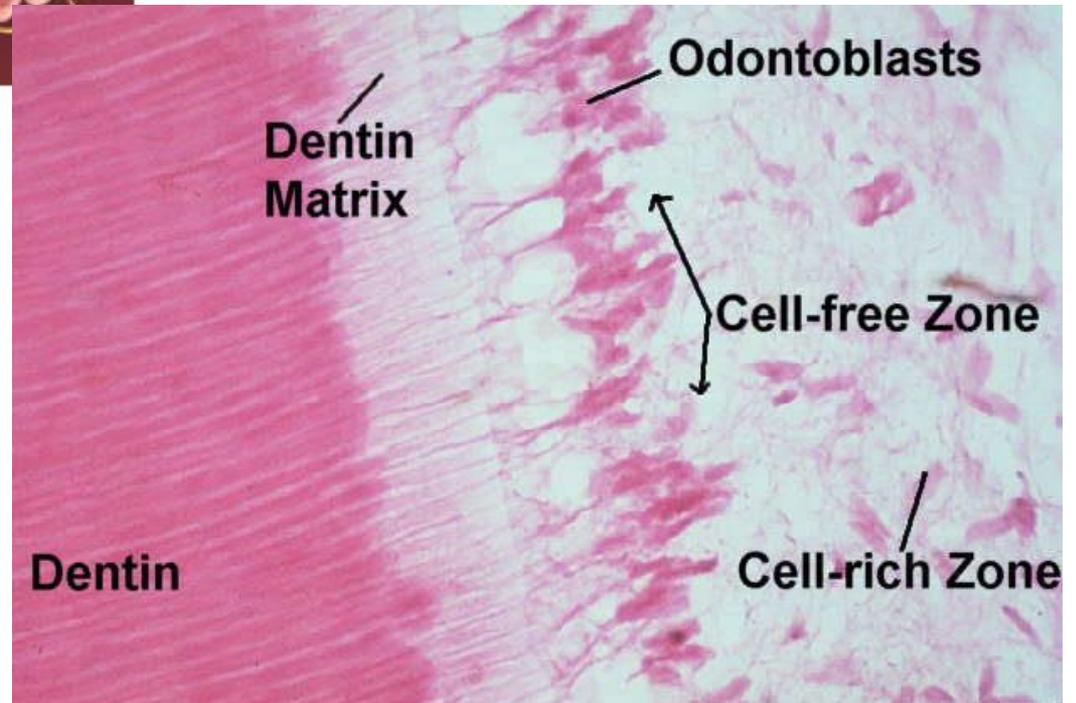
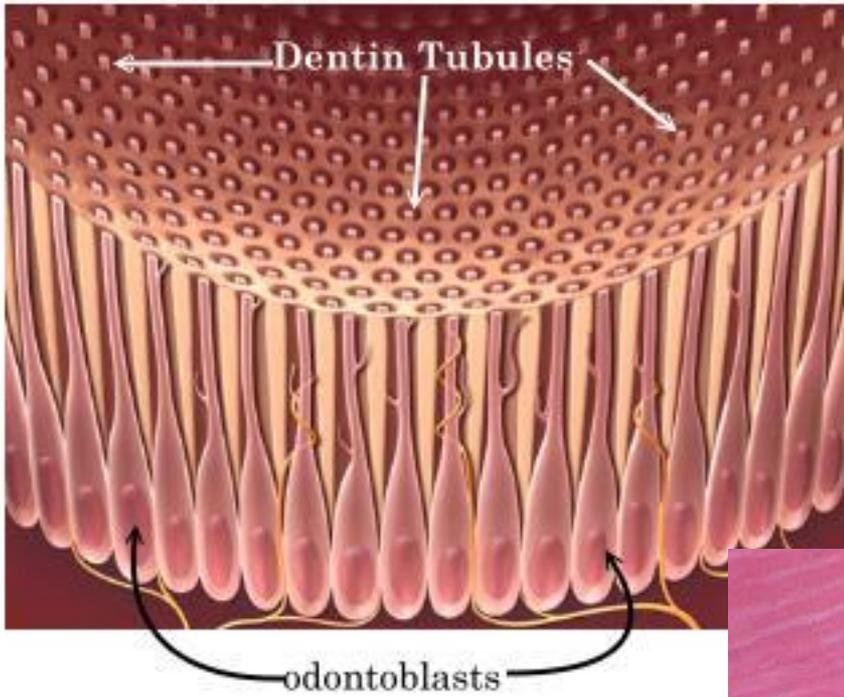
- **Kronenpulpa**

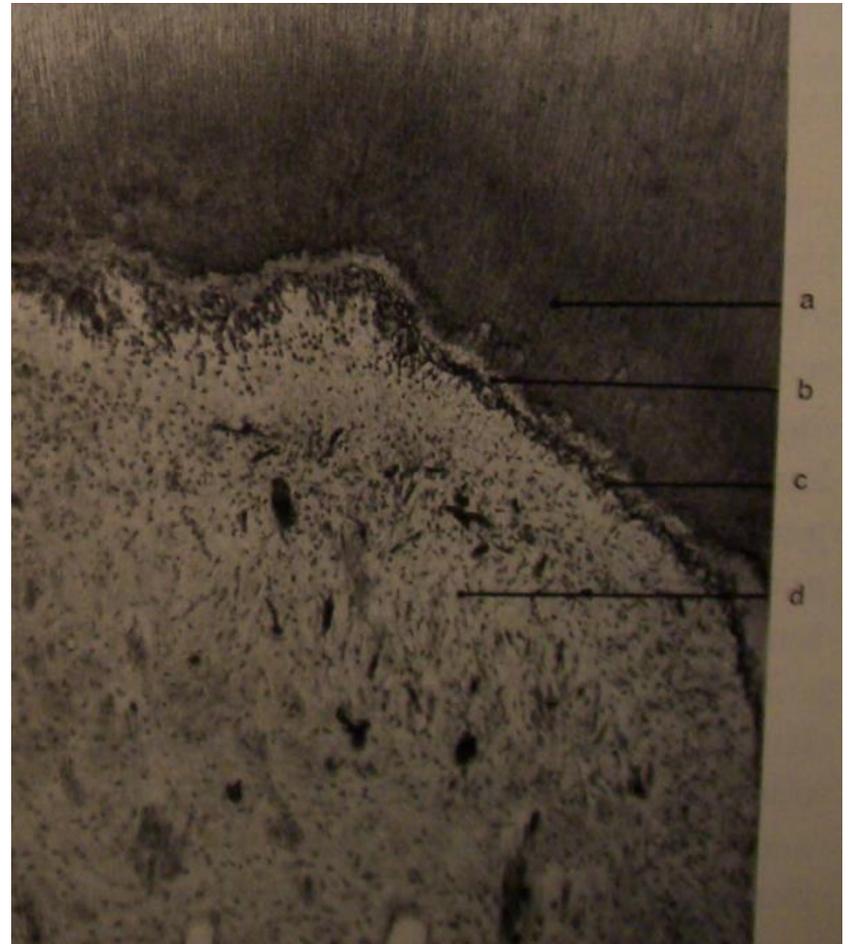
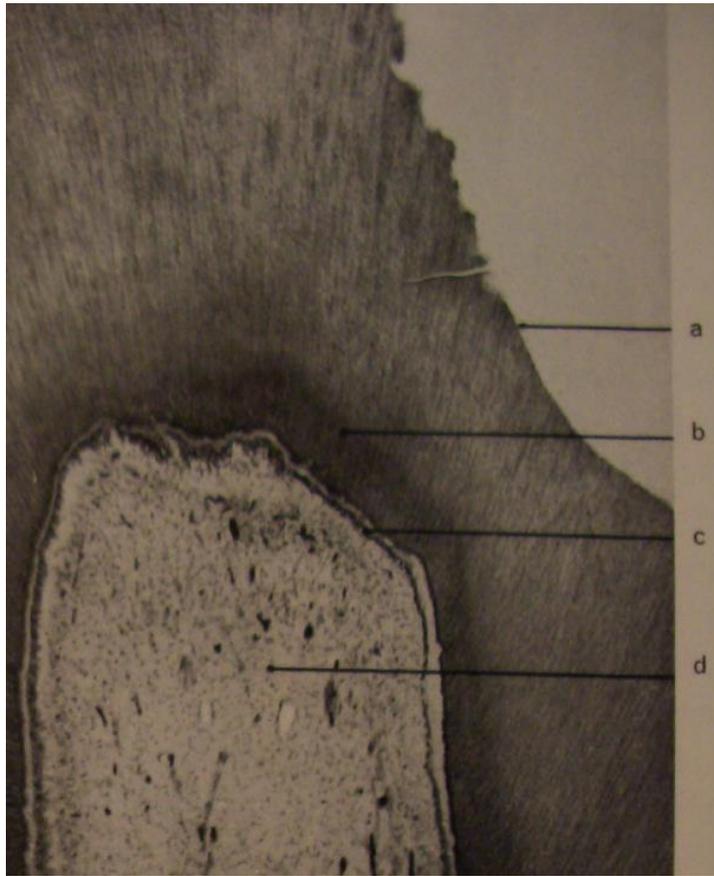
**50 000 Zellen / mm<sup>2</sup>**

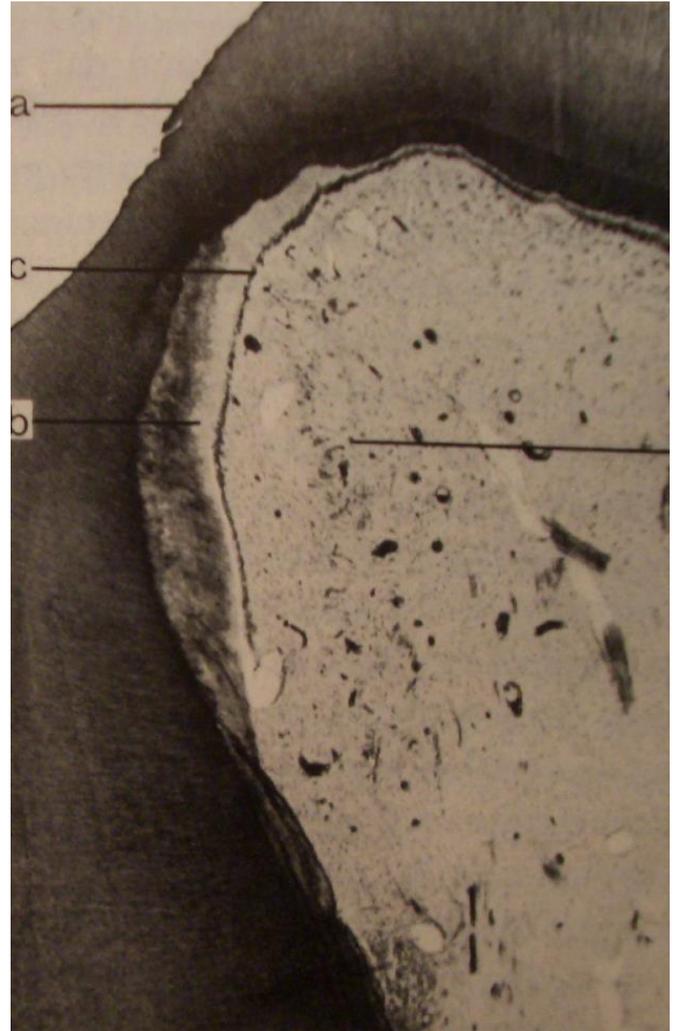
- **Wurzelpulpa**

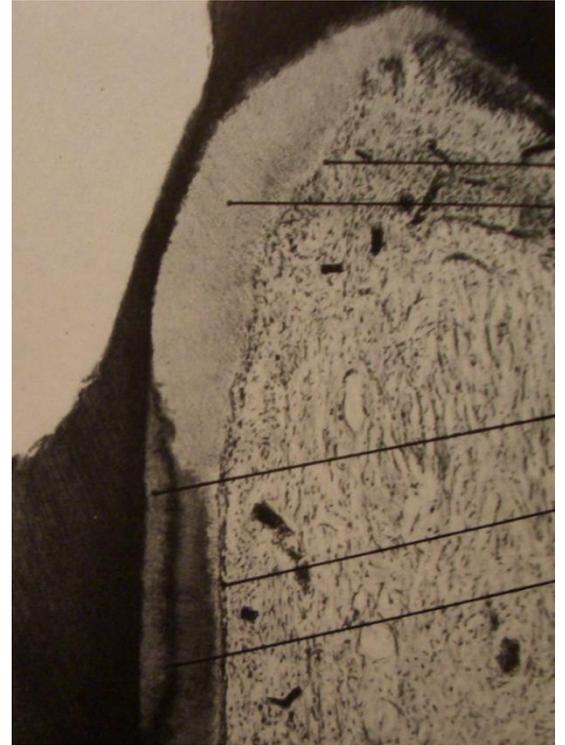
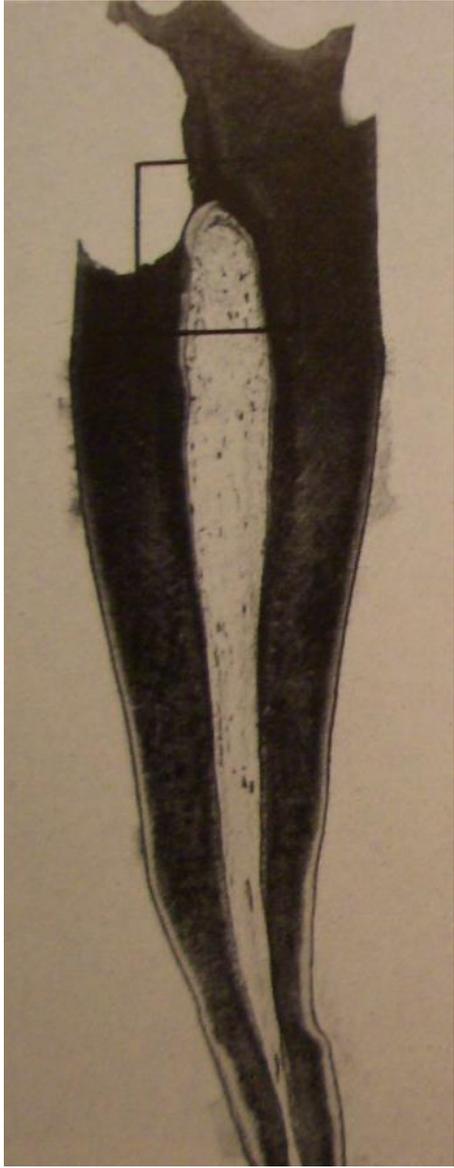
**signifikant weniger**



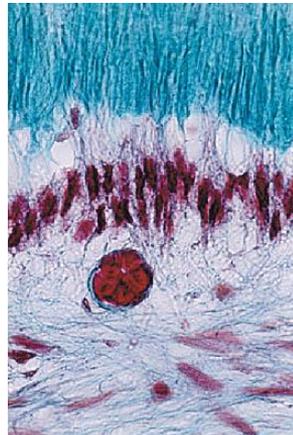
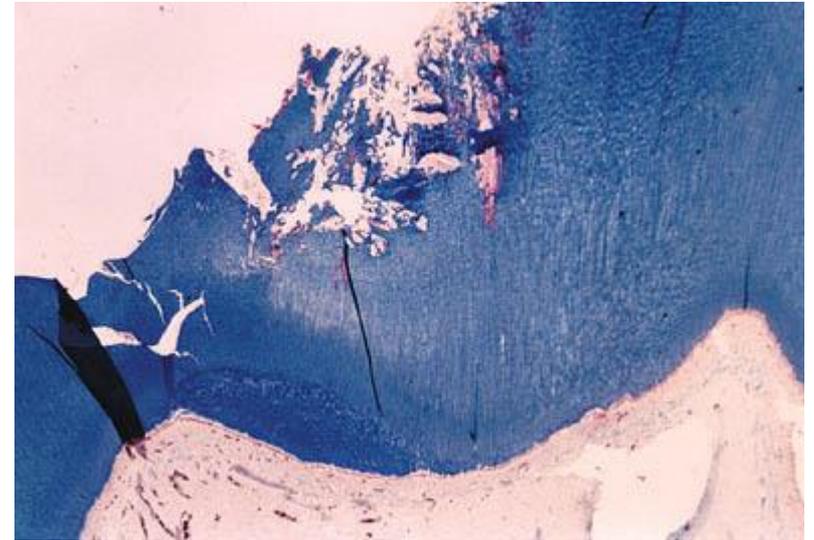




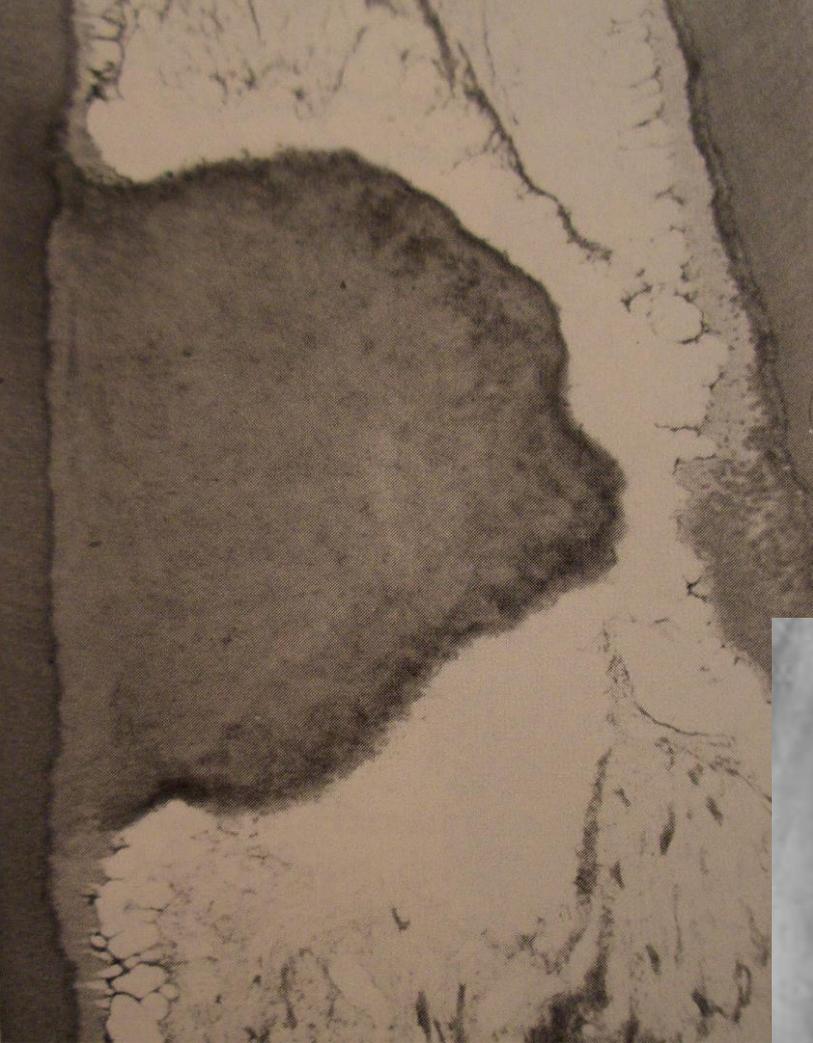




# Caries media

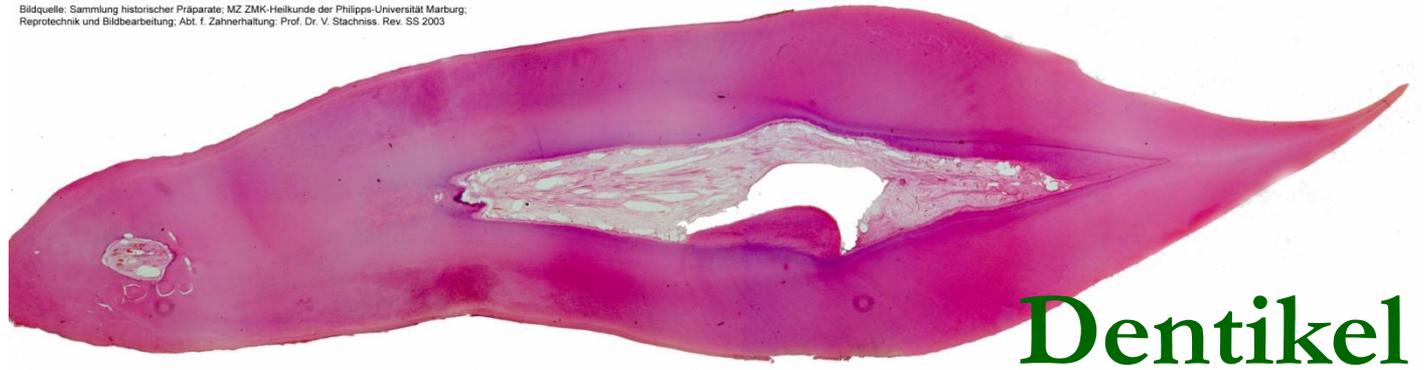


**Lokalisierte  
irreguläre  
Reizdentinbildung**





Bildquelle: Sammlung historischer Präparate, MZ ZMK-Heilkunde der Philipps-Universität Marburg; Reprotechnik und Bildbearbeitung; Abt. f. Zahnheilkunde, Prof. Dr. V. Stachniss, Rev. SS 2003



# Zahnbezeichnung

- **Zsigmondy-Palmer, Chevron,  
Set-Square System**
- **The FDI two-digit system  
(internationales Method)**
- **European, Scandinavian,  
Haderup System**
- **American (universales) System**

**FDI Federation Dentaire Internationale**

**WHO World Health Organization**

**IADR International Association for Dental  
Research**

# Zsigmondy-Palmer, Chevron, Set-Square System

8	7	6	5	4	3	2	1		1	2	3	4	5	6	7	8
---	---	---	---	---	---	---	---	--	---	---	---	---	---	---	---	---

---

8	7	6	5	4	3	2	1		1	2	3	4	5	6	7	8
---	---	---	---	---	---	---	---	--	---	---	---	---	---	---	---	---

Right

Left

V	IV	III	II	I		I	II	III	IV	V
---	----	-----	----	---	--	---	----	-----	----	---

---

V	IV	III	II	I		I	II	III	IV	V
---	----	-----	----	---	--	---	----	-----	----	---

# FDI

18 17 16 15 14 13 12 11

21 22 23 24 25 26 27 28

---

48 47 46 45 44 43 42 41

---

31 32 33 34 35 36 37 38

Right

Left

55 54 53 52 51

61 62 63 64 65

---

85 84 83 82 81

---

71 72 73 74 75

**European, Scandinavian,**

**Haderup System**

8+ 7+ 6+ 5+ 4+ 3+ 2+ 1++1 +2 +3 +4 +5 +6 +7 +8

Right

Left

8- 7- 6- 5- 4- 3- 2- 1-

-1 -2 -3 -4 -5 -6 -7 -8

# USA

**1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16**

**32 31 30 29 28 27 26 25 24 23 22 21 20 19 18**

**17**

**Right**

**Left**