

# Permanent Incisors

- ◆ 8 in number
- ◆ 2 each quadrant
- ◆ Crown simple cylinder
- ◆ Single rooted



# Central Maxillary Incisor

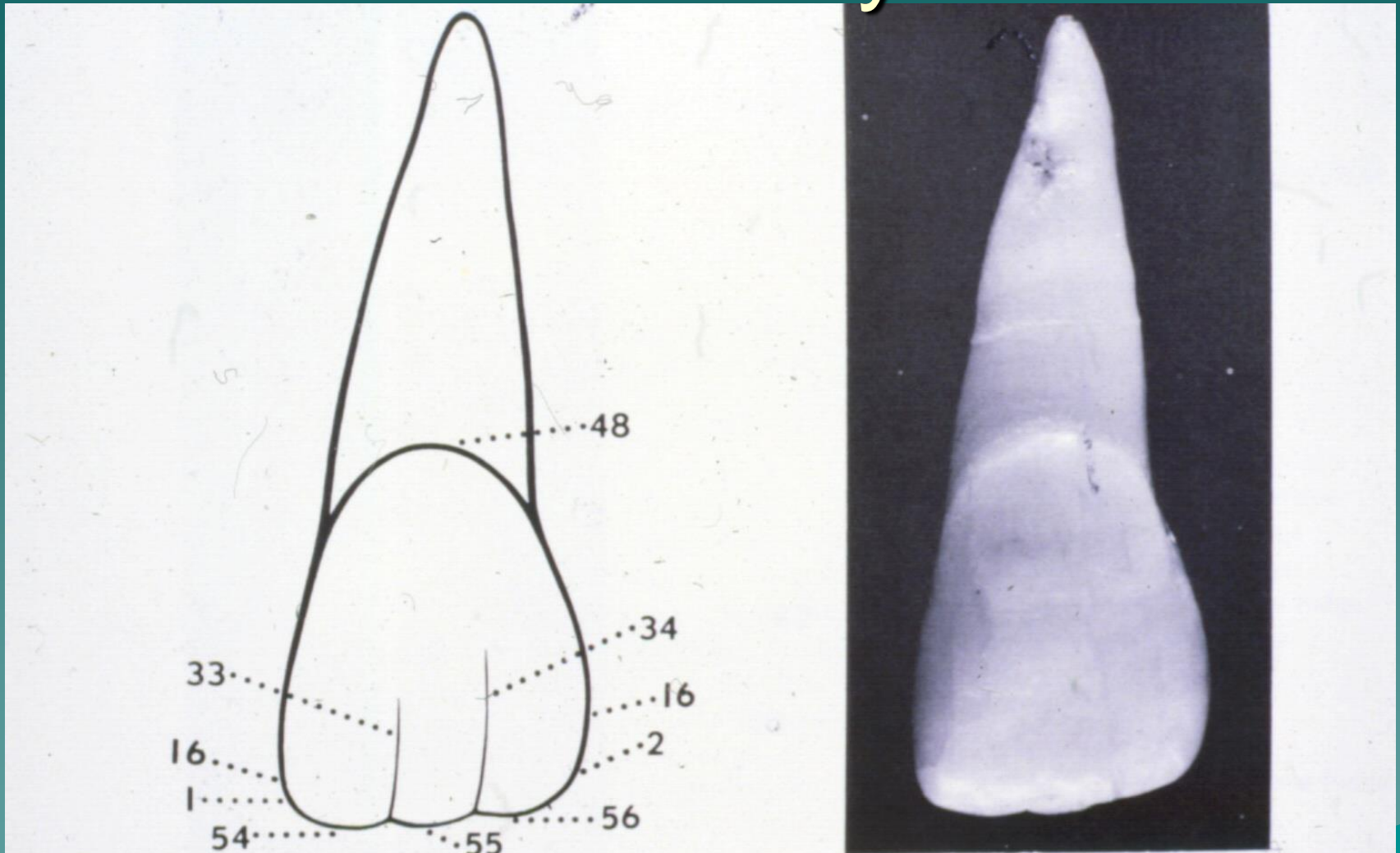
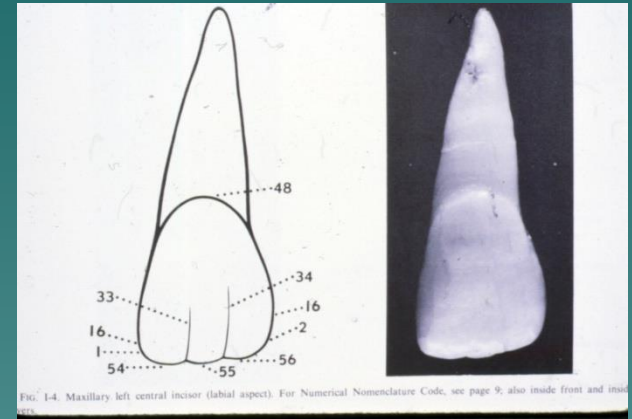


FIG. 1-4. Maxillary left central incisor (labial aspect). For Numerical Nomenclature Code, see page 9; also inside front and inside views.

# Four Lobe Tooth

## Three Labial Lobes

- ◆ Central lobe
- ◆ Two lateral lobes
- ◆ Each with a mammelon
- ◆ Separated by labial lobe grooves



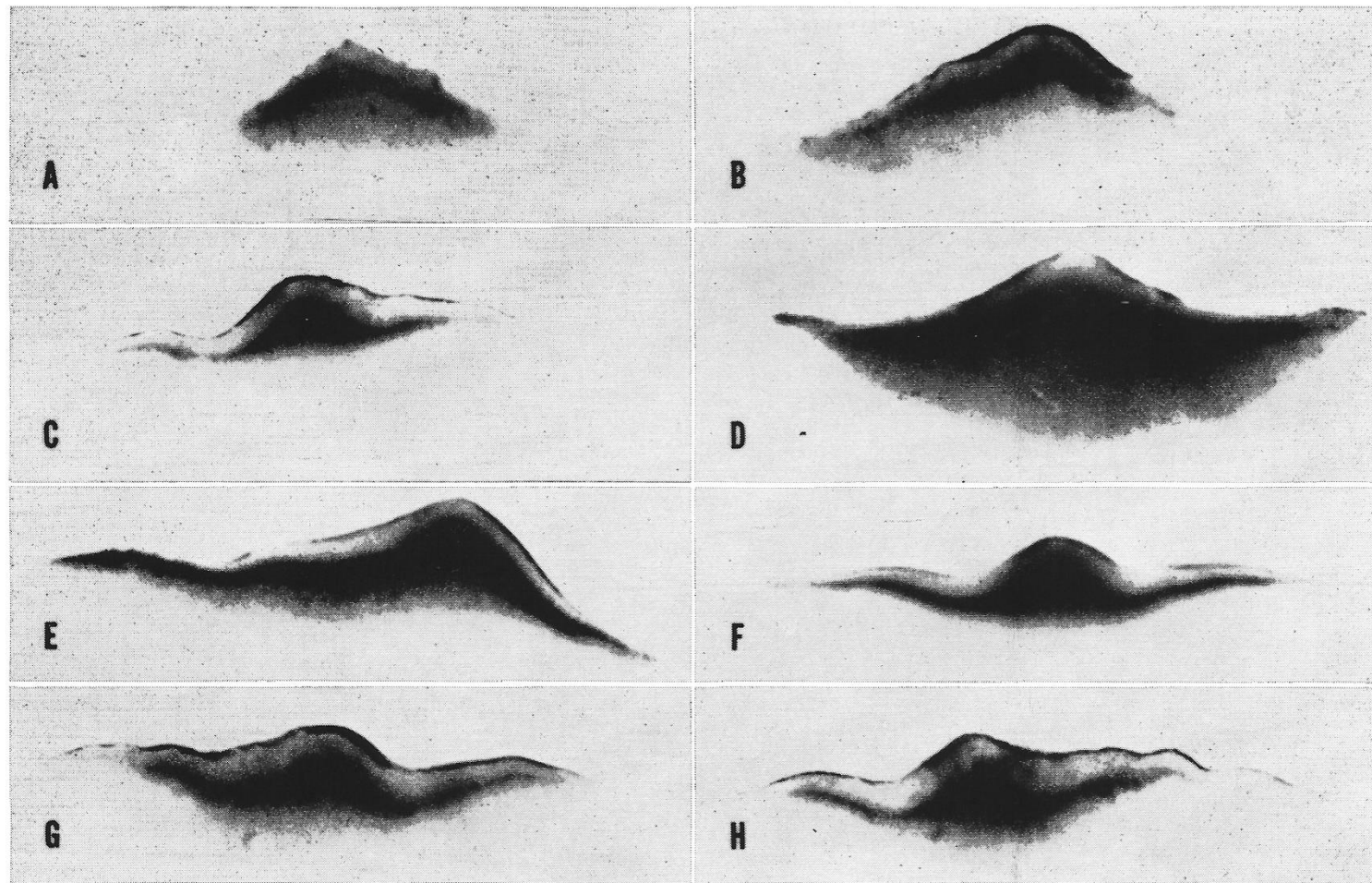
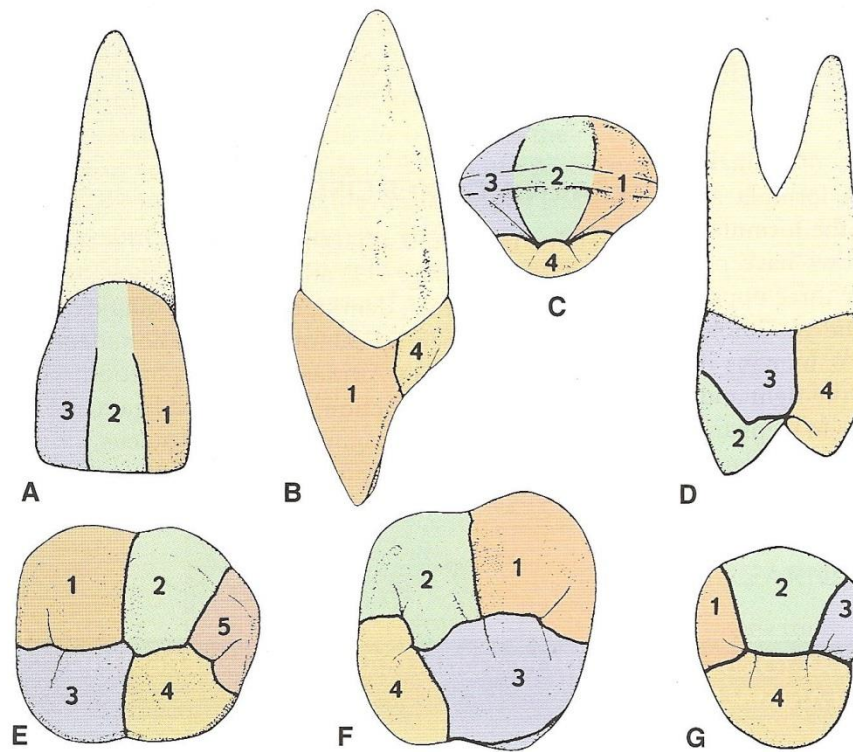


FIGURE 51. Eight stages in the progressive calcification of the maxillary central incisor. (Kraus, "Calcification of the Human Deciduous Teeth," courtesy of J.A.D.A., 59, 1128-1136.)



**FIGURE 1-45.** Lobes or primary anatomic divisions on teeth. Drawings A, B, and C show the facial, mesial, and incisal views of a maxillary central incisor that, like all *anterior teeth*, forms from *four lobes*. The lingual cingulum develops from one lobe (labeled 4) seen in views B and C. Mamelons may appear on the incisal edge of newly erupted incisors, an indication of the three labial lobes. Drawings D and G are the mesial and occlusal view of a *two-cusped premolar* that also forms from *four lobes*. As with anterior teeth, the facial cusp forms from three lobes, and one lingual lobe forms the lingual cusp. The divisions between the facial and lingual lobes are evidenced by the marginal ridge developmental grooves. **Each cusp of a molar is formed by one lobe.** Drawing E is a mandibular first molar with five lobes, three buccal, and two lingual, which is one lobe per cusp. Drawing F is a maxillary first molar with three larger lobes and one smaller lobe, or one per cusp. A very small fifth (Carabelli) cusp, when present, may form from a part of the large mesiolingual lobe, or may form from a separate lobe.

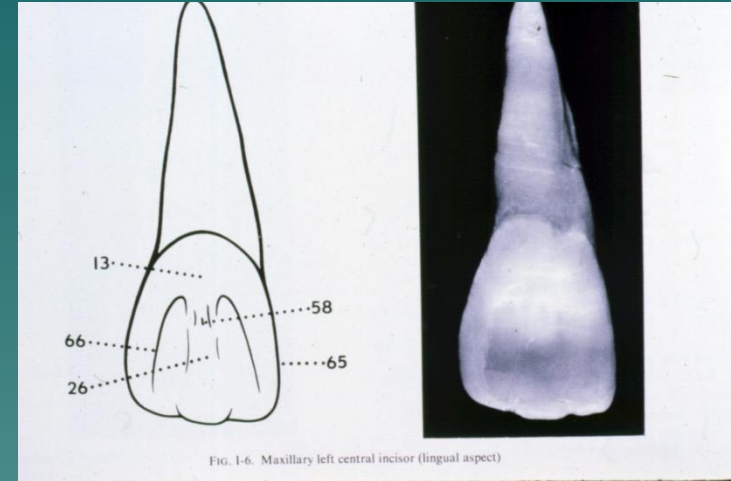
cusps (mandibular second), form from five lobes: three forming the facial cusp, and two forming the two lingual cusps (one lobe per cusp). Three very subtle vertical ridges separated by two subtle depressions provide evidence that three lobes form the facial surfaces of anterior teeth and premolars.

As a general rule, each **molar** cusp forms from one lobe. For example, maxillary or mandibular molars

with five cusps form from five lobes, and those with four cusps form from four lobes. Some maxillary molars have as few as three cusps and form from three lobes. Two types of tooth anomalies, peg-shaped maxillary lateral incisors and some extra teeth (also called supernumerary teeth), form from less than three lobes. Guidelines for determining the number of lobes that form each tooth are presented in *Table 1-5*.

# Lingual View

- ◆ Lingual fossa 26
- ◆ Mesial & distal marginal ridges 65 66
- ◆ Cingulum 13
- ◆ Lingual pit or tubercle 58



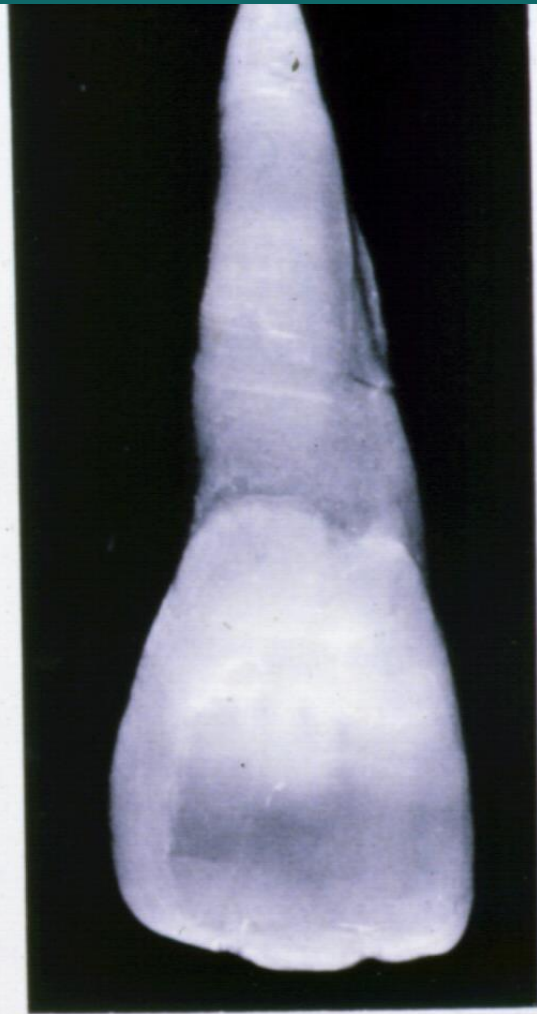
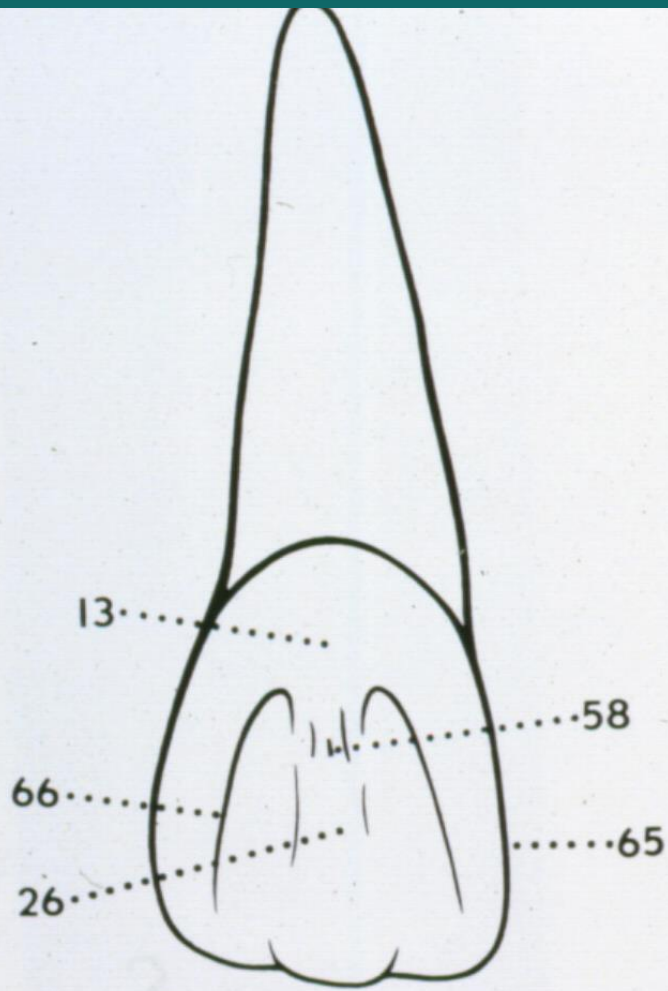


FIG. 1-6. Maxillary left central incisor (lingual aspect)



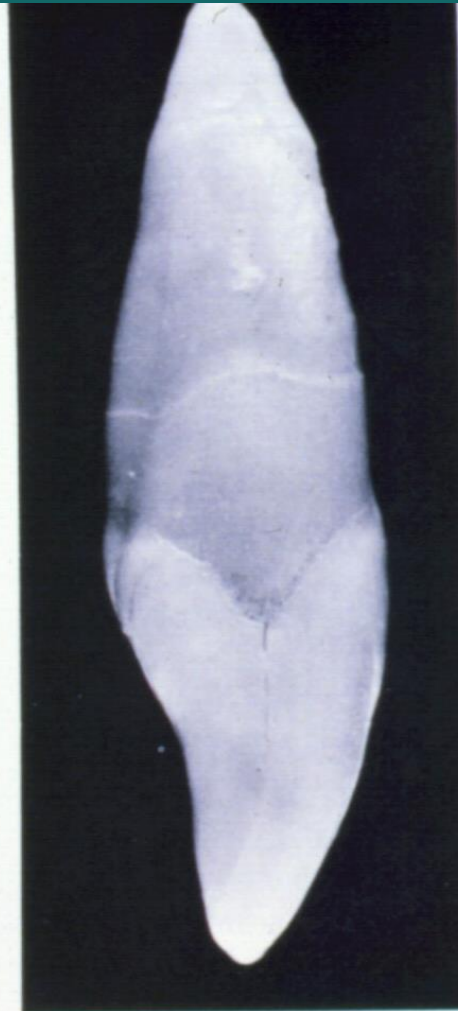
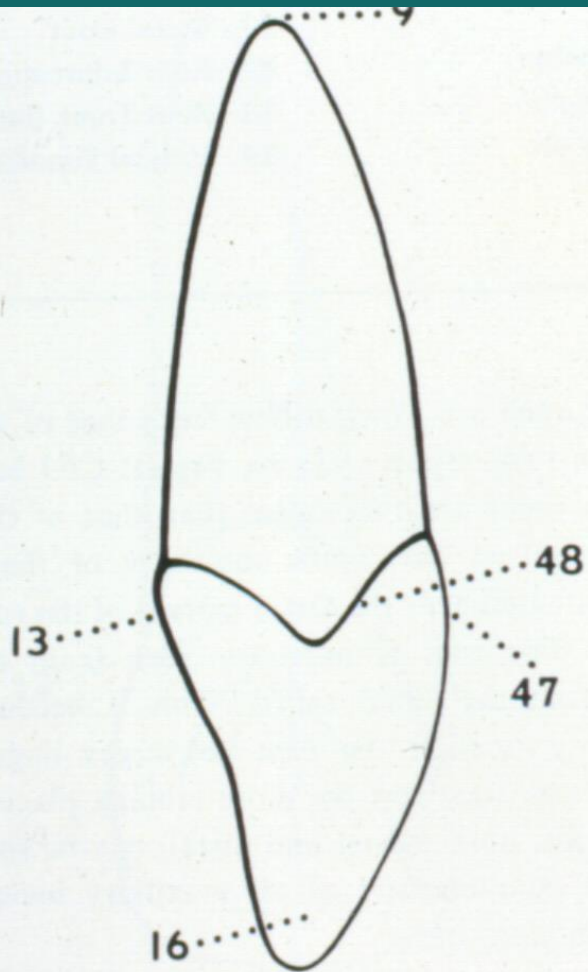


FIG. 1-9. Maxillary left central incisor (mesial aspect)

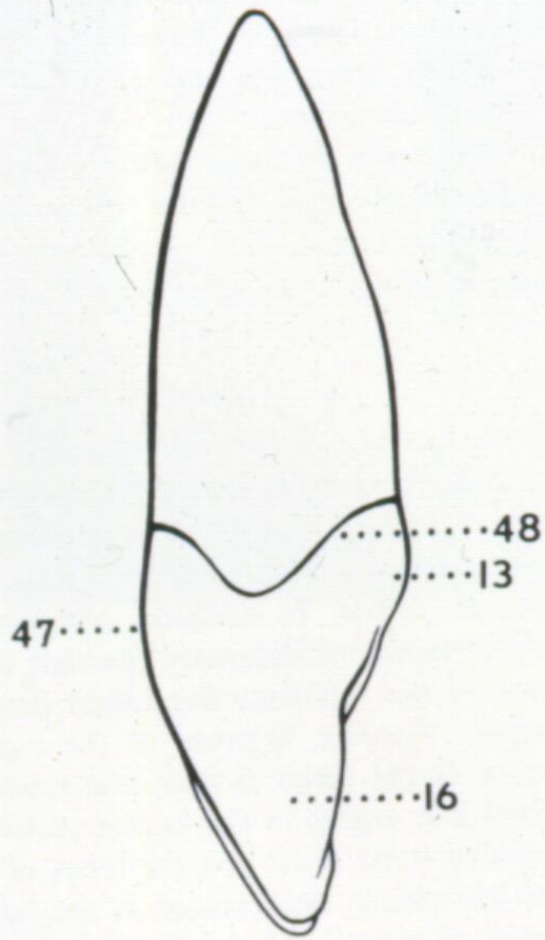


FIG. I-11. Maxillary left central incisor (distal aspect)

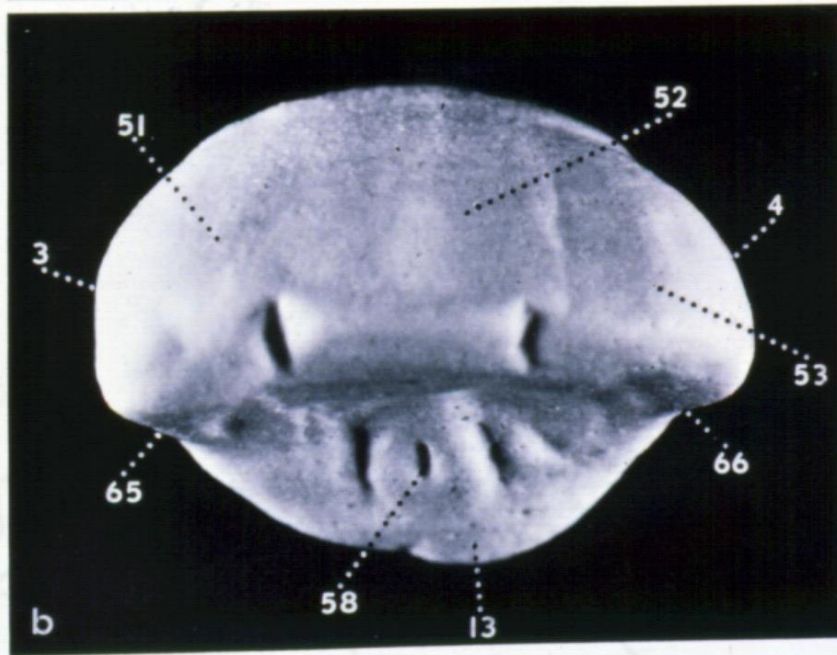
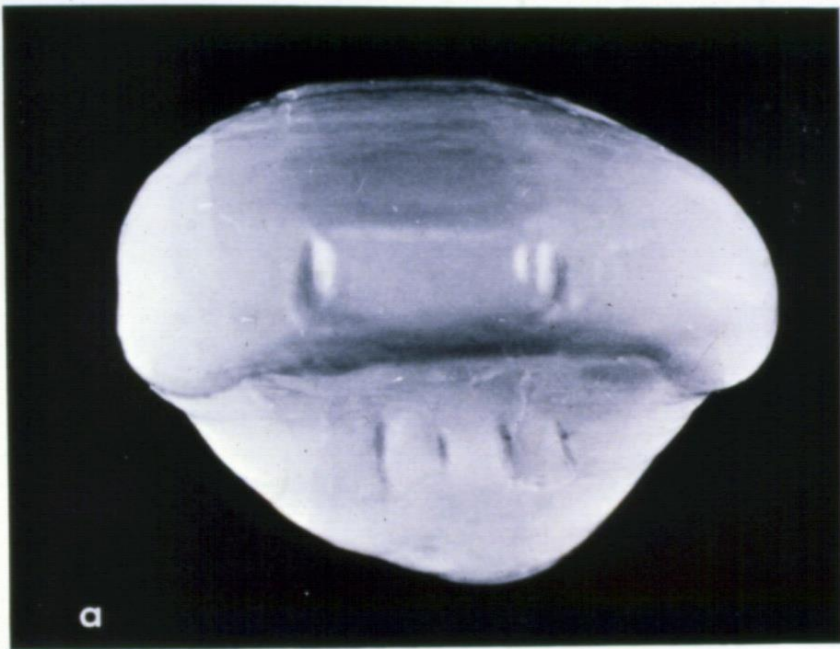
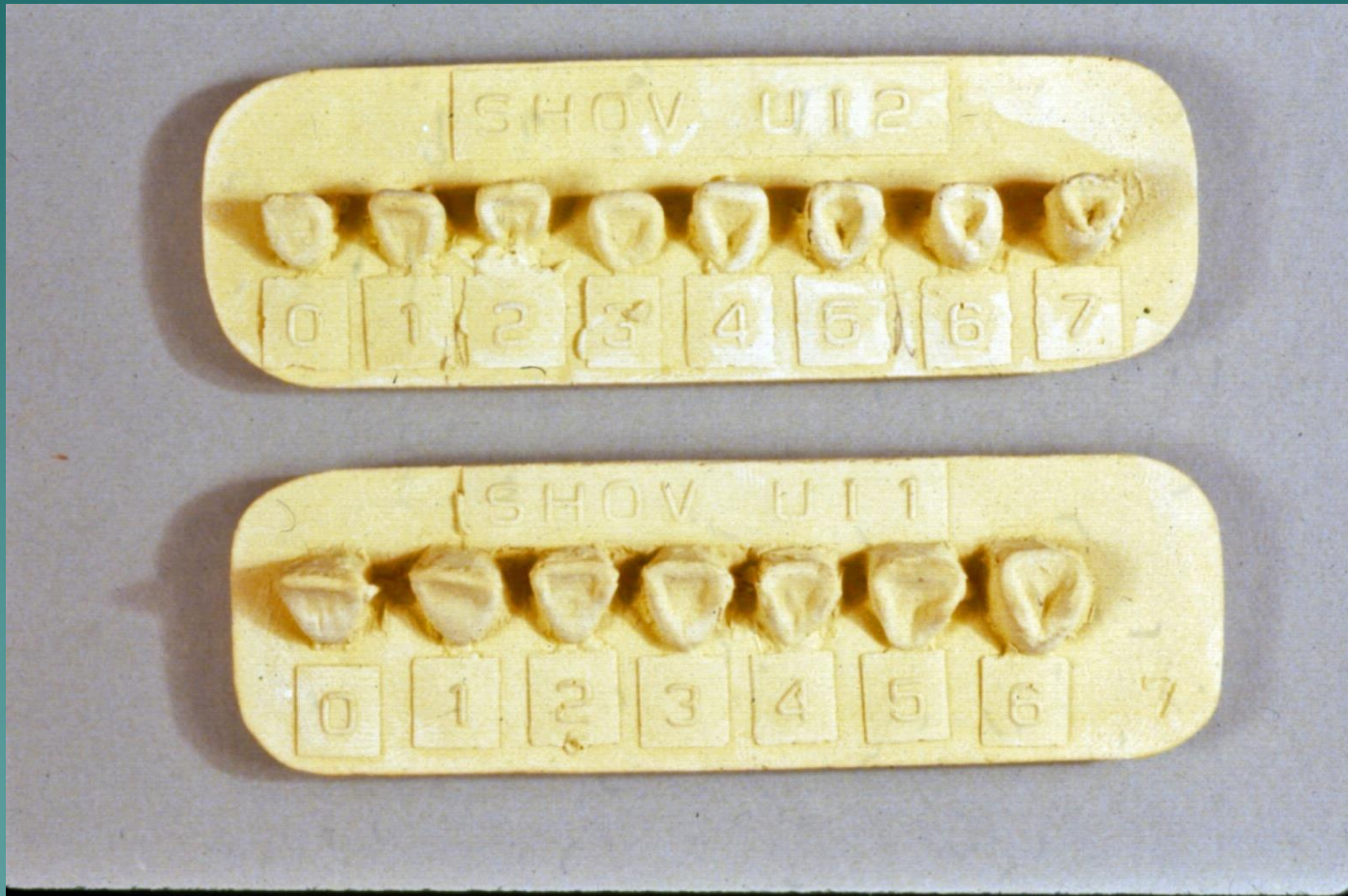


FIG. 1-13. Maxillary left central incisor (incisal aspect). *a*, actual crown, *b*, cast

# Marginal ridges – shovel shape



# None – No Shoveling



# Shoveling



# Tuberculum dentale



# tubercles





# Winging

[figure F]

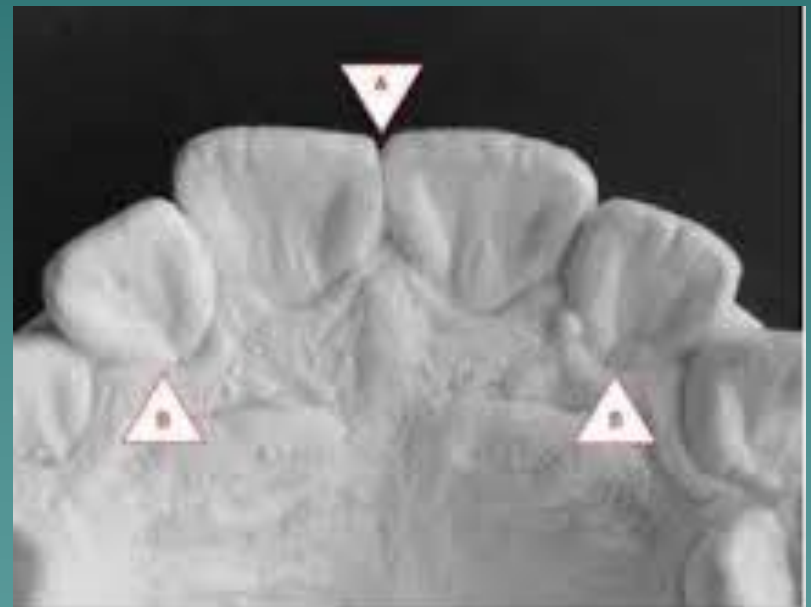
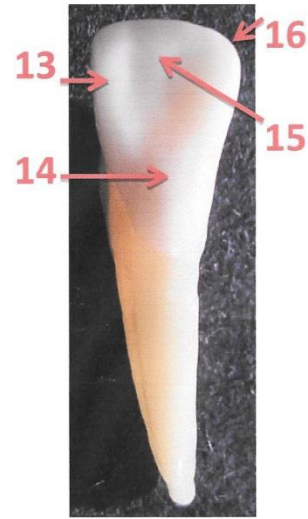
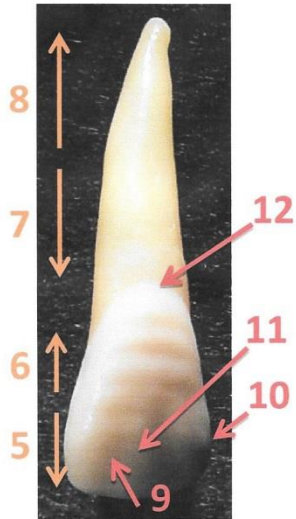
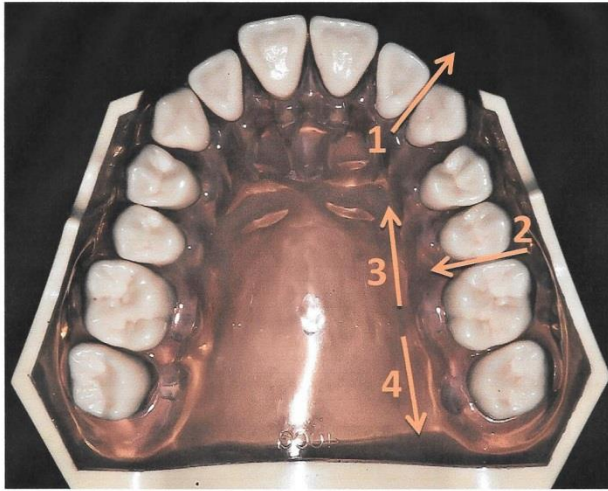


Figura 2. A. Incisivos centrales superiores con winging grado 0 (ausente).  
B. Incisivos laterales superiores con crowding leve grado 2 (palatina)

Figure 2 A. Upper central incisors with degree 0 winging (absent)  
B. Upper lateral incisors with slight degree 2 crowding (palatal)







# Lateral Maxillary Incisor

- ◆ Narrower and shorter than central
- ◆ Distal angle more rounded
- ◆ Roundedness



# Maxillary Lateral Incisor

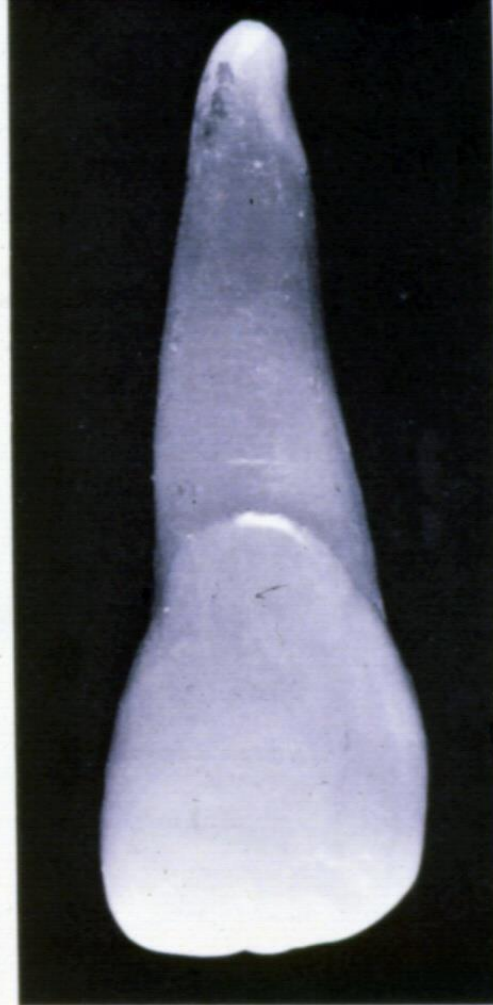
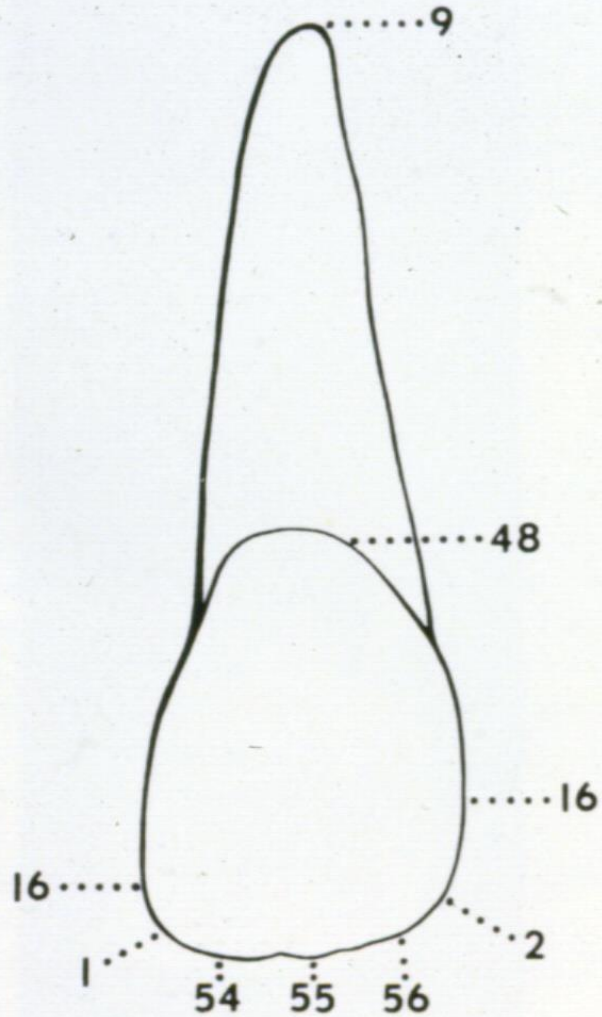


FIG. 1-5. Maxillary left lateral incisor (labial aspect)

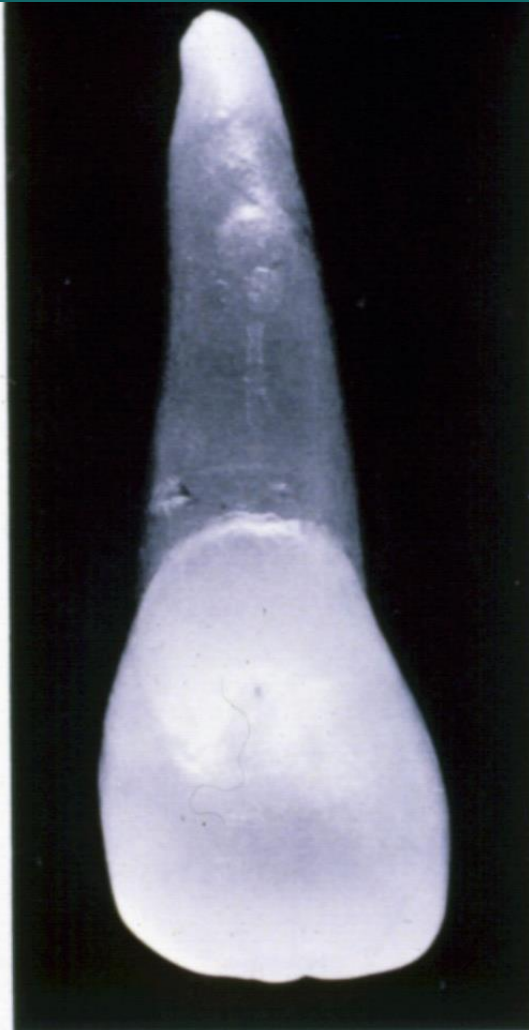
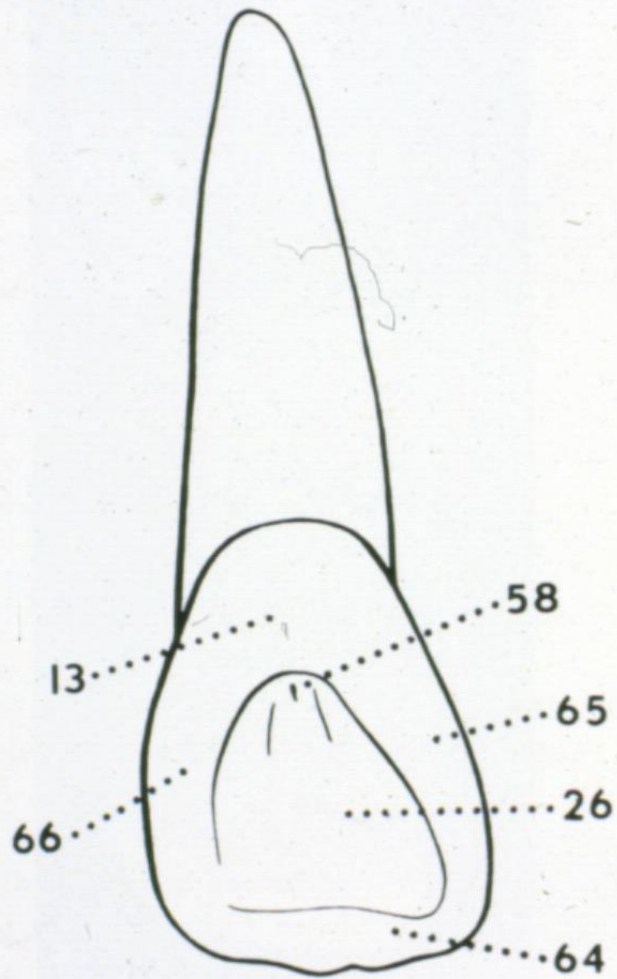
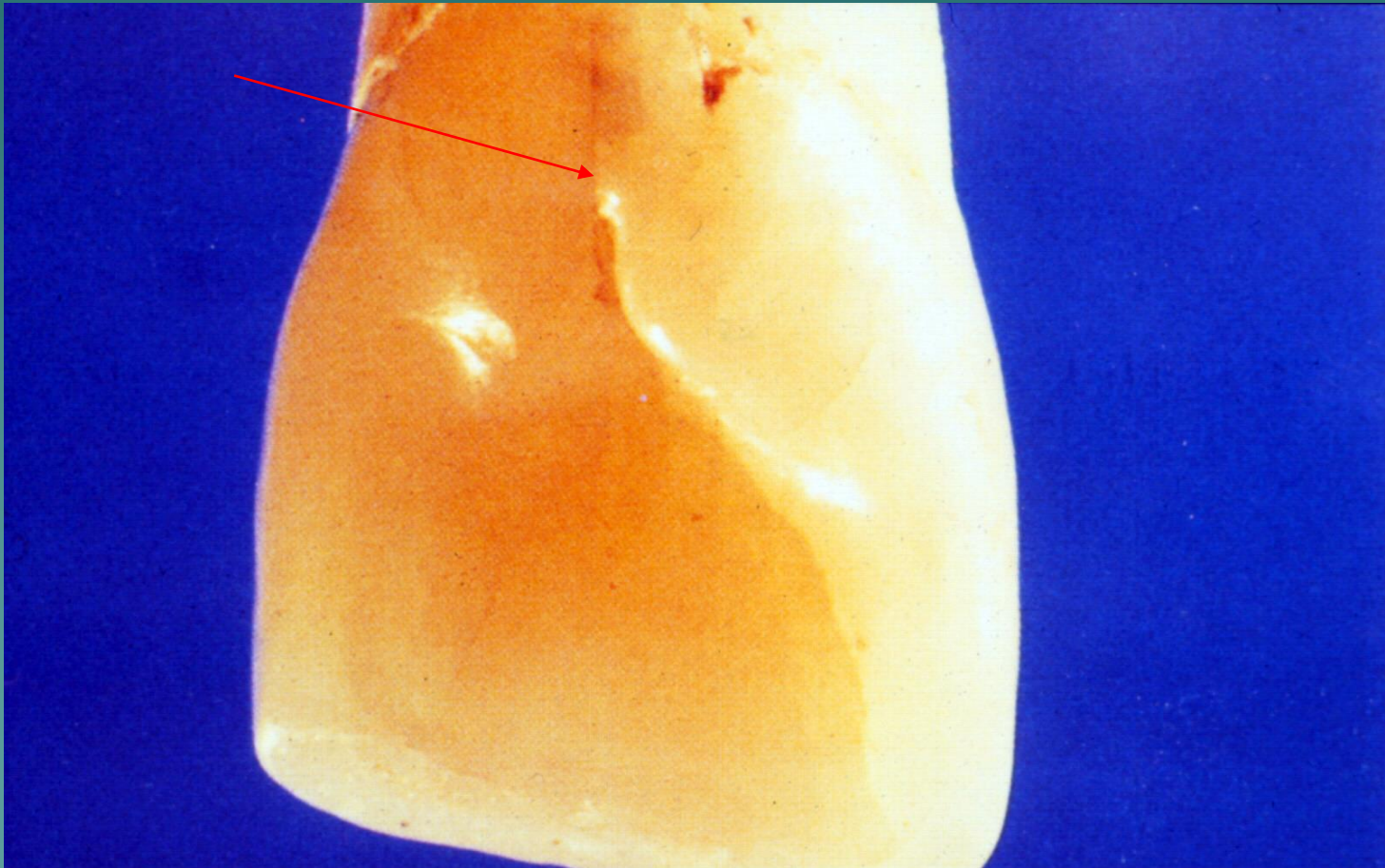


FIG. I-7. Maxillary left lateral incisor (lingual aspect)

# Lingual Marginal Groove









# Mandibular Incisors

- ◆ Movable cutting edges
- ◆ Slide behind maxillary incisors
- ◆ Smaller than maxillary
- ◆ Central and lateral similar in size

# Labial View

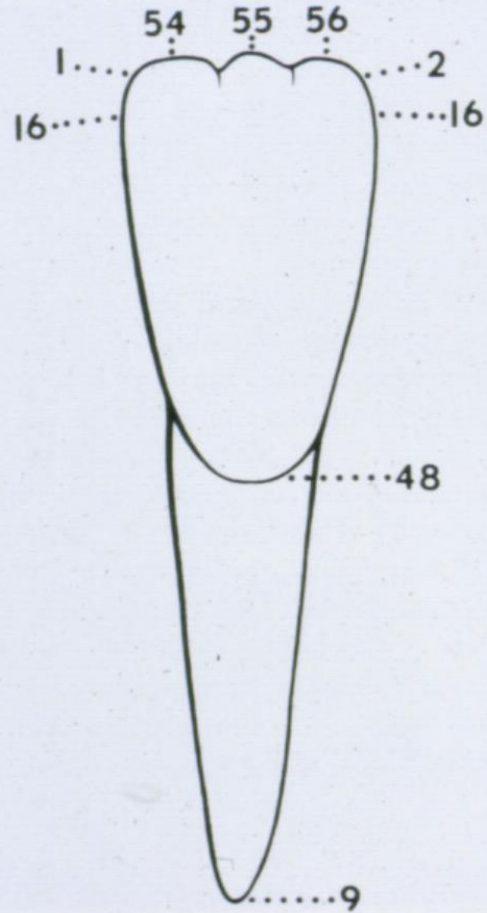


FIG. I-32. Mandibular left central incisor (labial aspect)

# Lingual View

PERMANENT INCISO

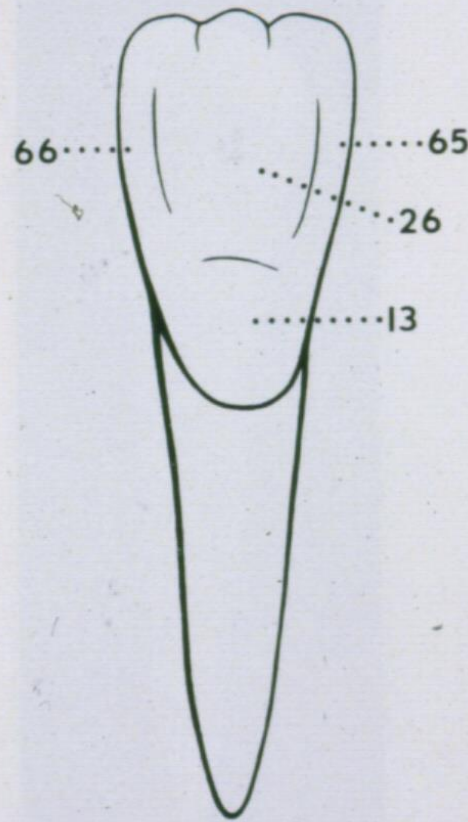


FIG. I-34. Mandibular left central incisor (lingual aspect)

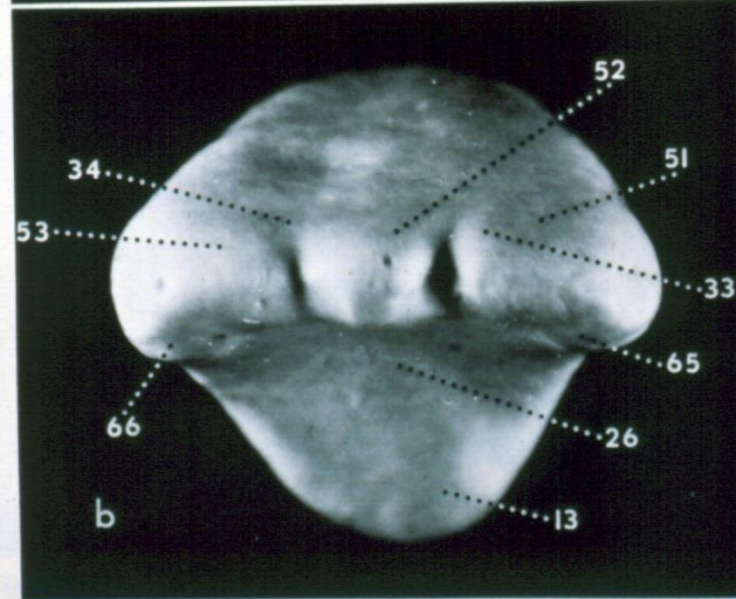
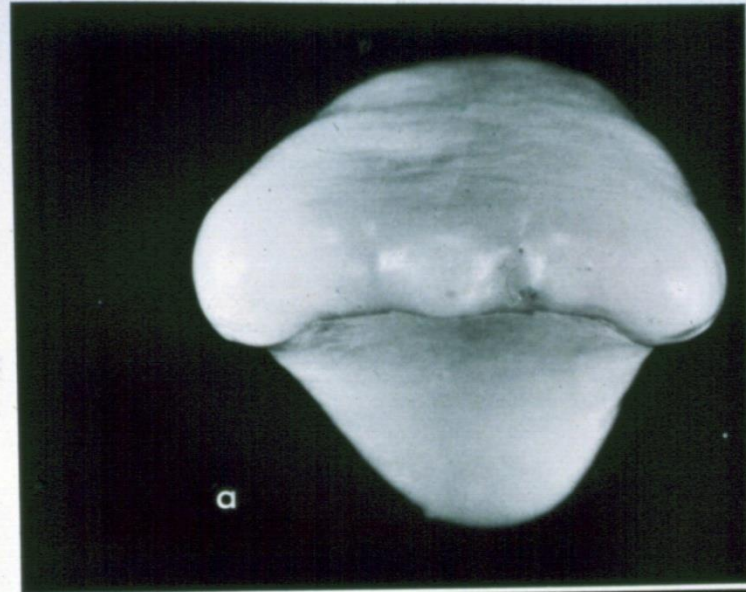


FIG. 1-41. Mandibular left central incisor (incisal aspect). *a*, actual crown; *b*, cast

# Mesial View

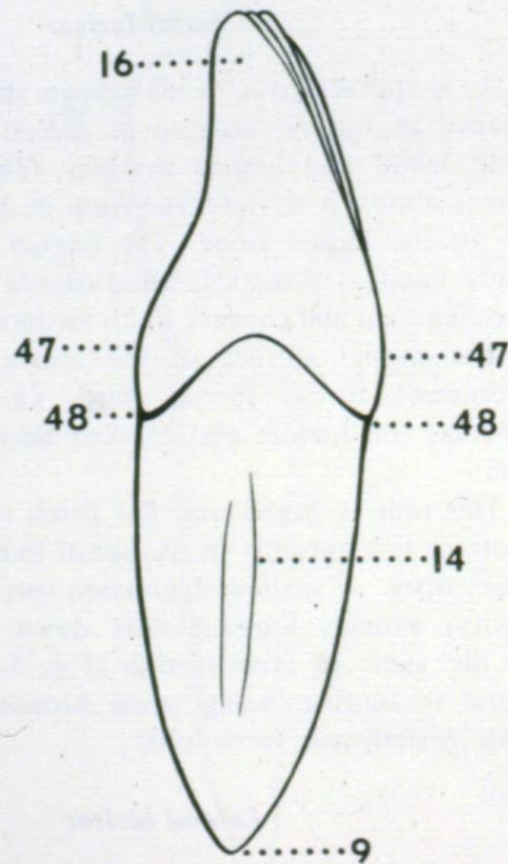


FIG. 1-36. Mandibular left central incisor (mesial aspect)

# Distal View

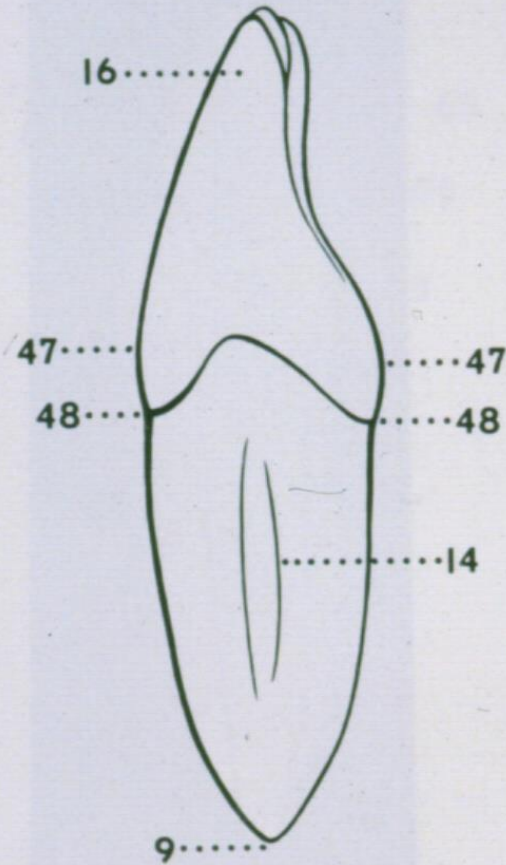


FIG. I-39. Mandibular left central incisor (distal aspect)

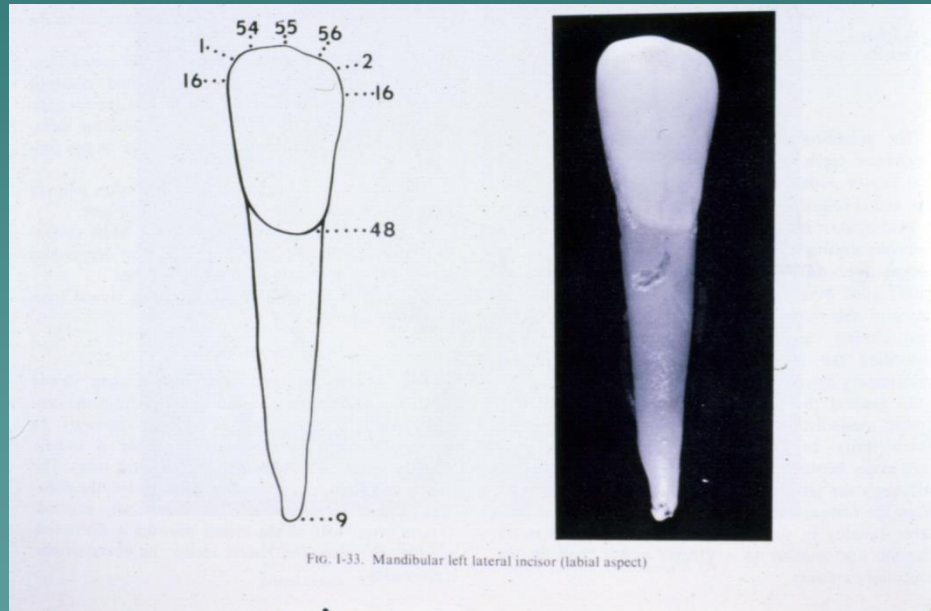






# Mandibular Lateral Incisor

- ◆ Wider than central
- ◆ Asymmetrical



# Mandibular Lateral Incisor

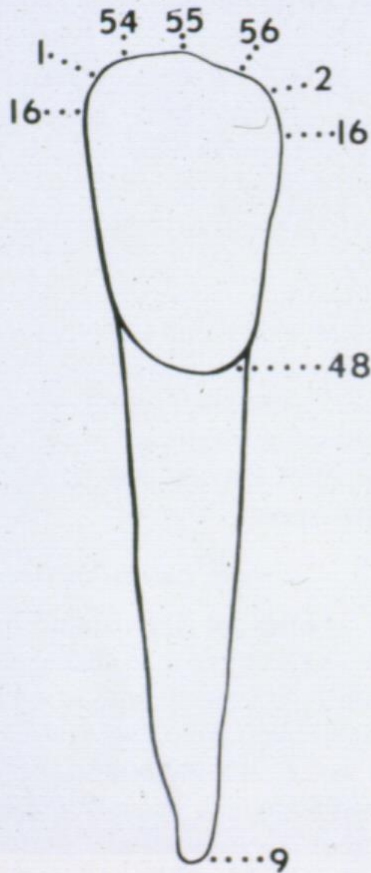


FIG. 1-33. Mandibular left lateral incisor (labial aspect)

# Lingual View

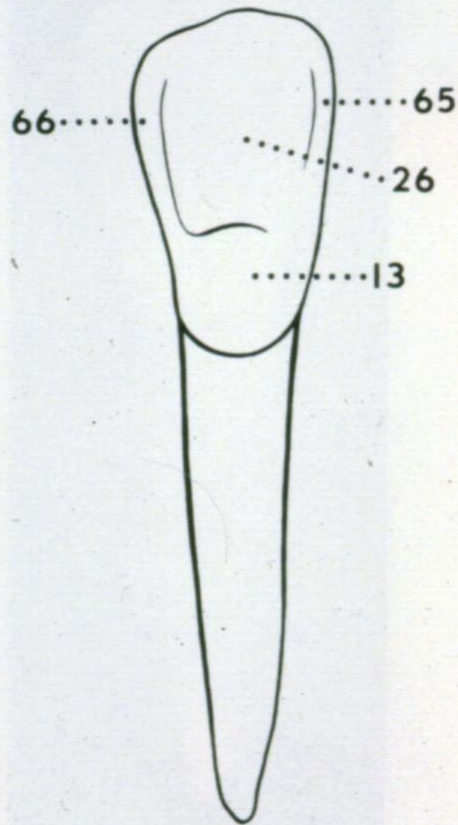


FIG. I-35. Mandibular left lateral incisor (lingual aspect)

• ANATOMY

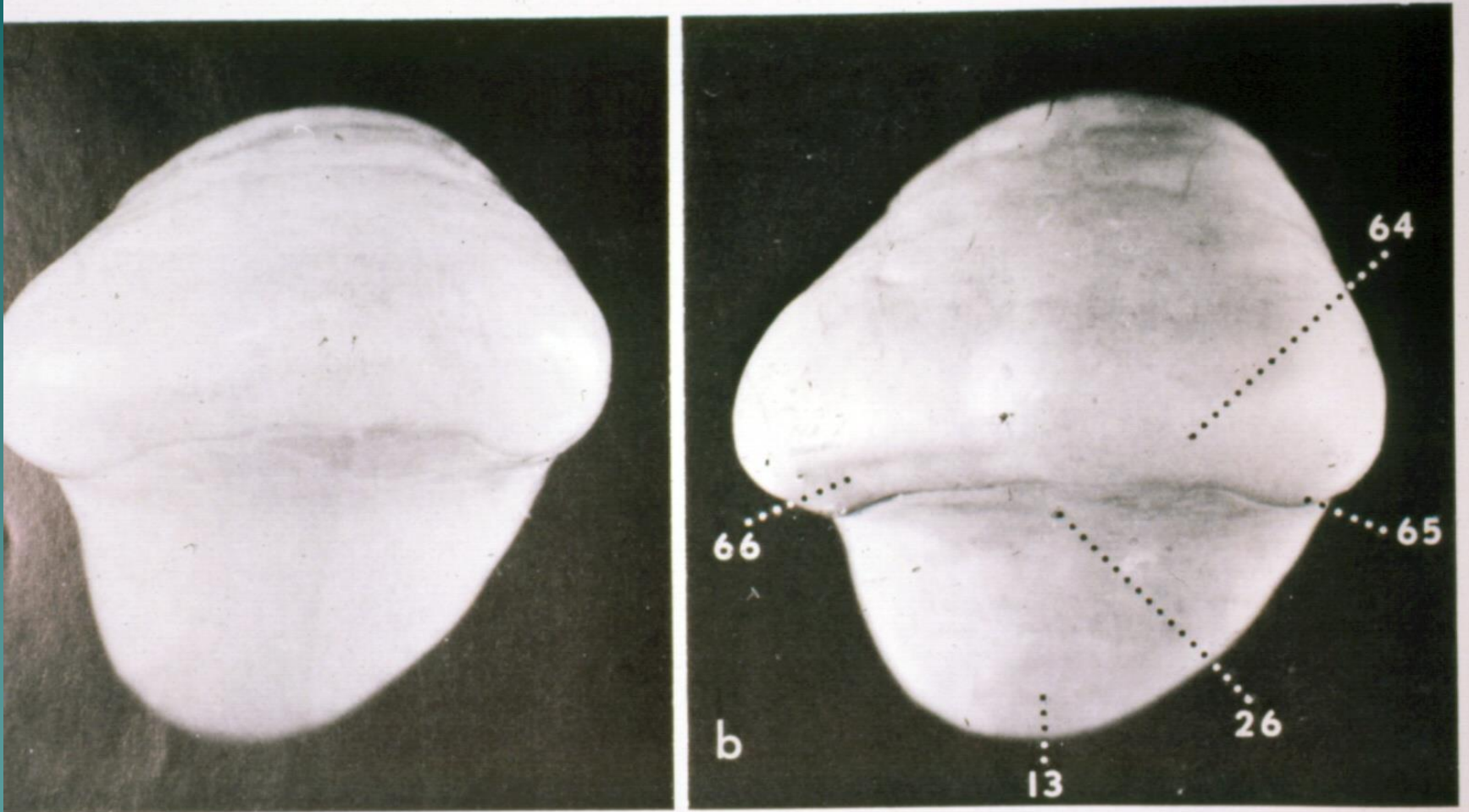


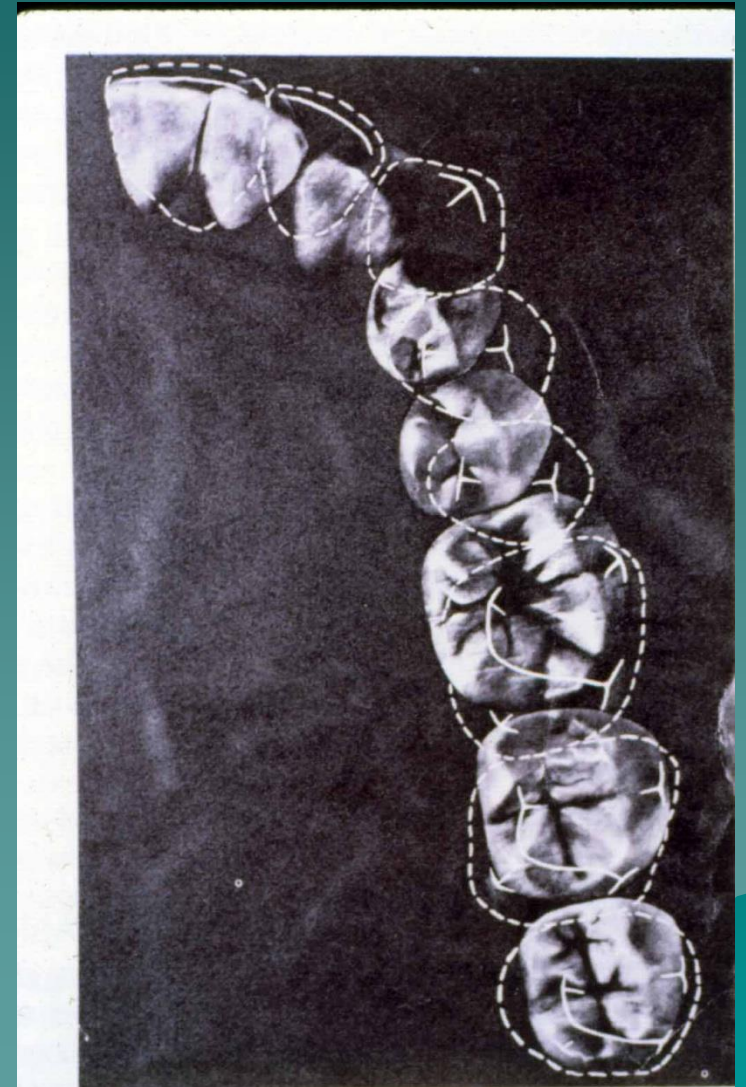
FIG. I-42. Mandibular left lateral incisor (incisal aspect). *a*, actual crown; *b*, cast



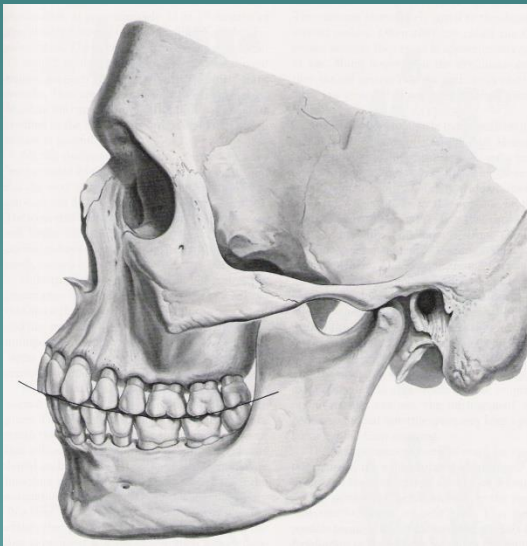




# Occlusion



# Curve of Spee



# Curve of Wilson

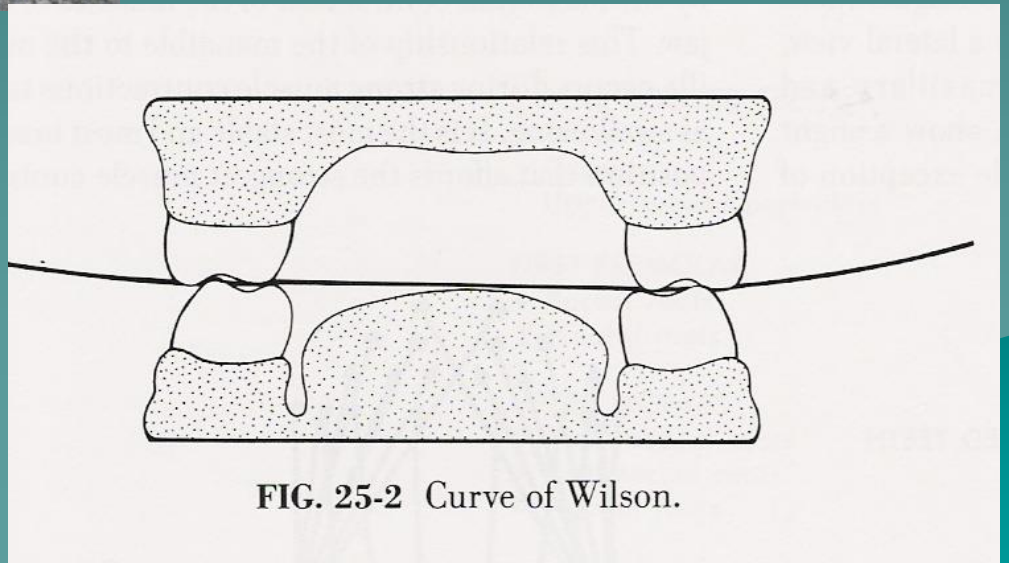
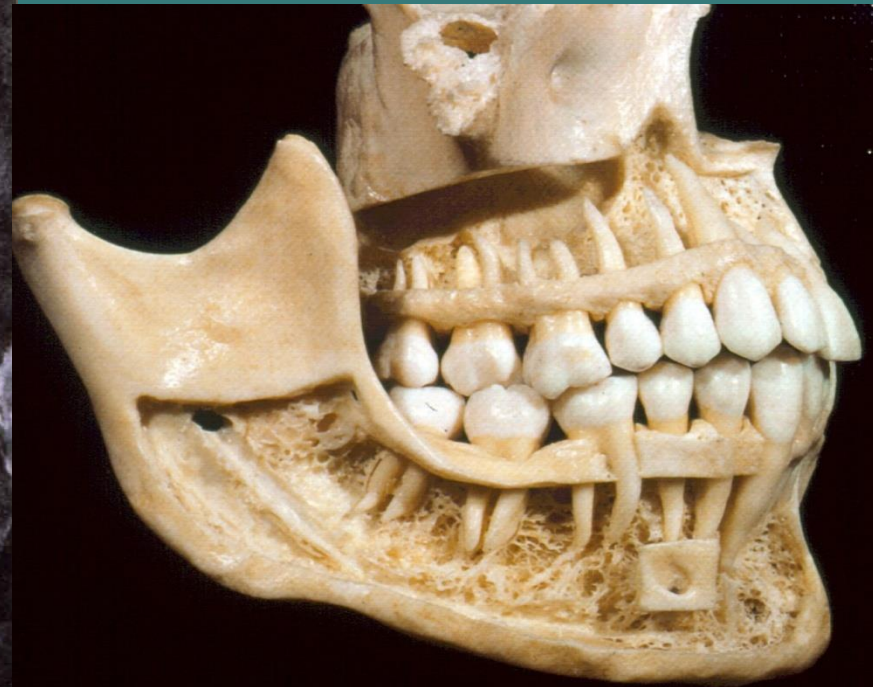
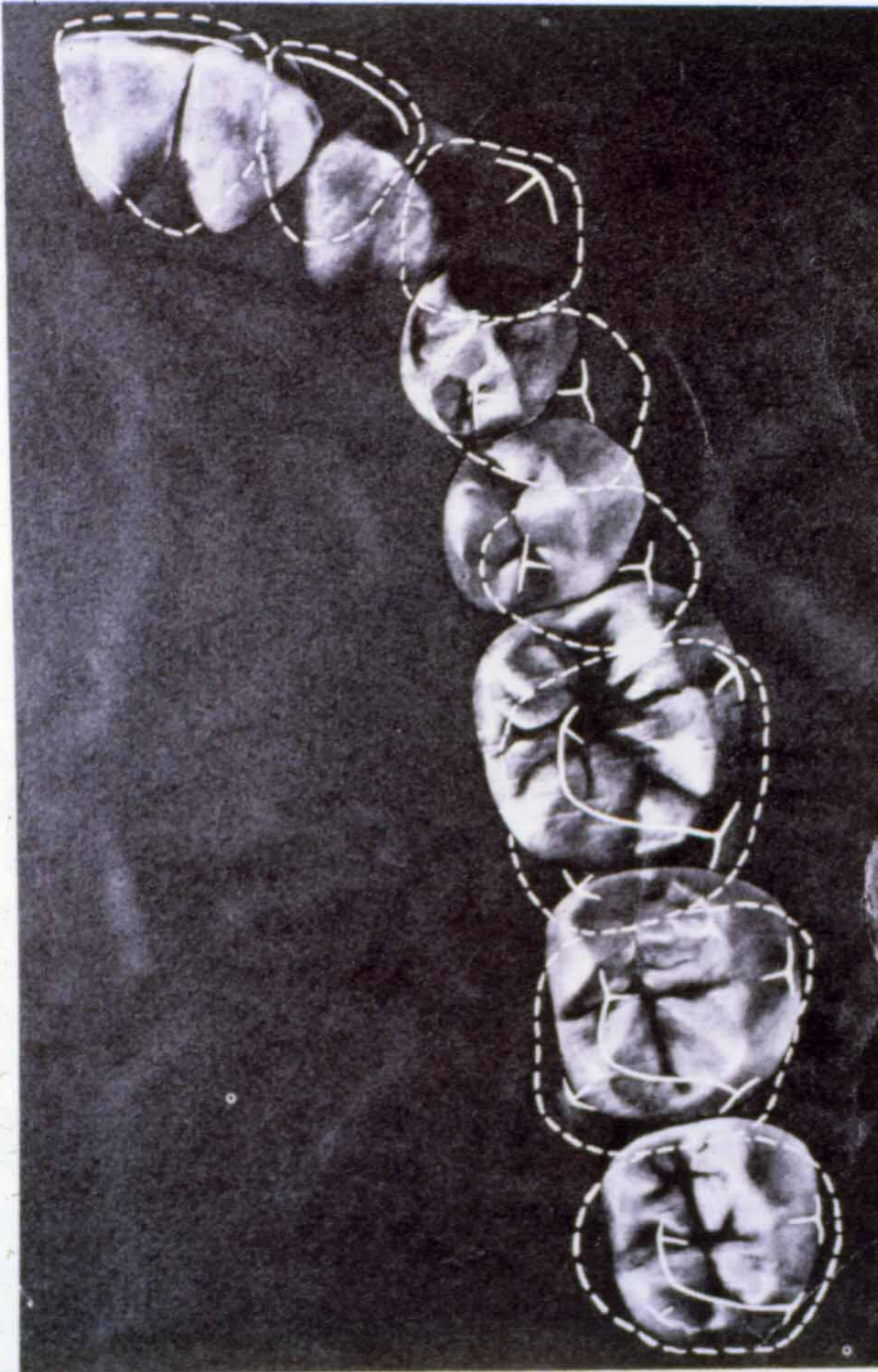
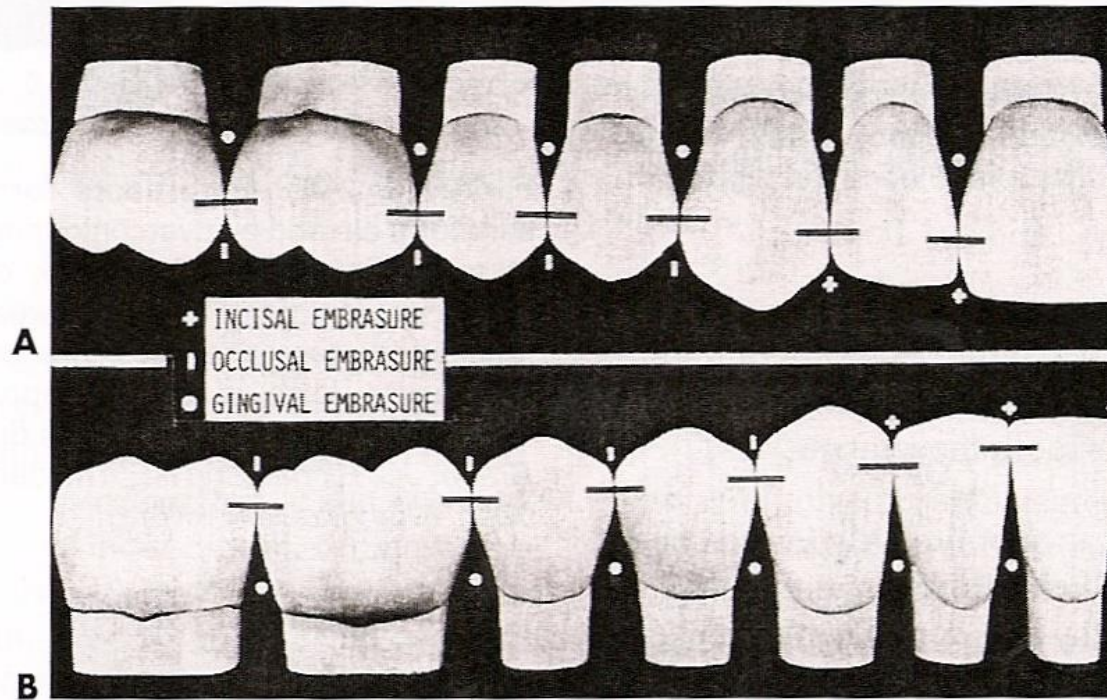


FIG. 25-2 Curve of Wilson.

# Static Occlusion

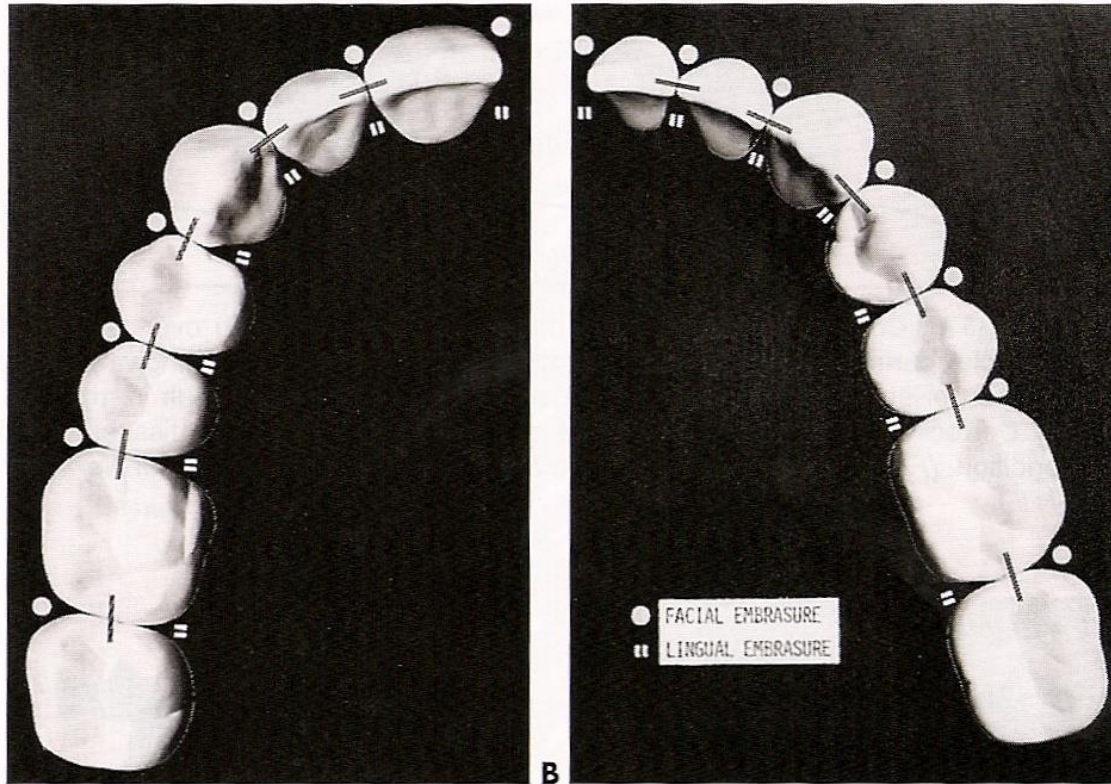


# Proximal Contacts



**FIGURE 2-41** Proximal contact area. *Black lines* show positions of contacts incisogingivally and occlusogingivally. Incisal, occlusal, and gingival embrasures are indicated. **A**, Maxillary teeth. **B**, Mandibular teeth.

# Superior View Contacts



**FIGURE 2-40** Proximal contact area. *Black lines* show positions of contacts faciolingually. **A**, Maxillary teeth. **B**, Mandibular teeth. Facial and lingual embrasures are indicated.

# Permanent Canines



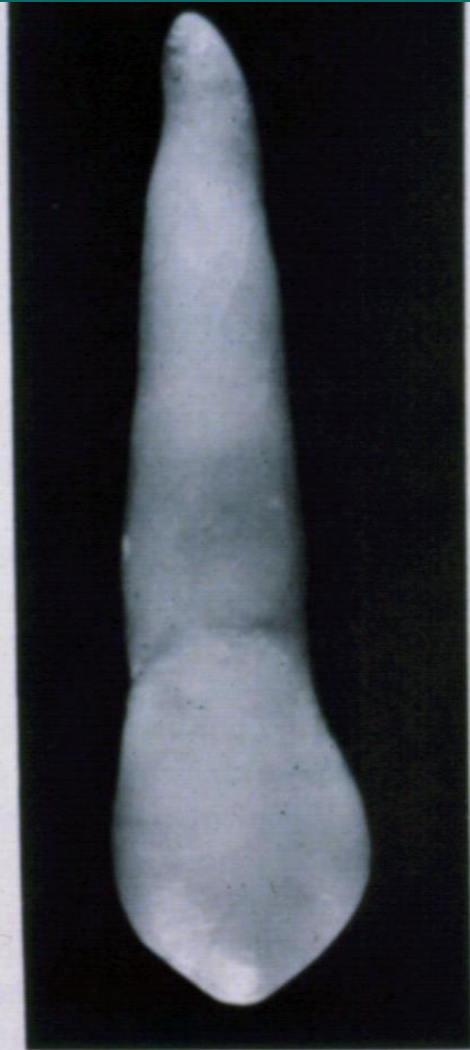
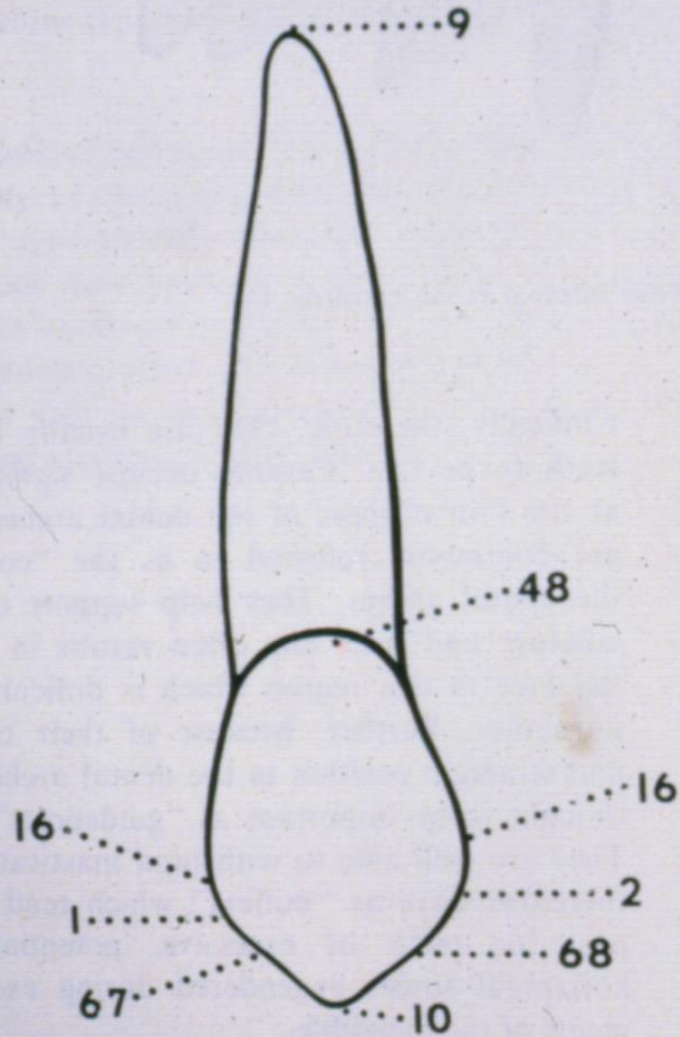


FIG. I-50. Maxillary left canine (labial aspect)



## CROWN



## ROOT



## APEX



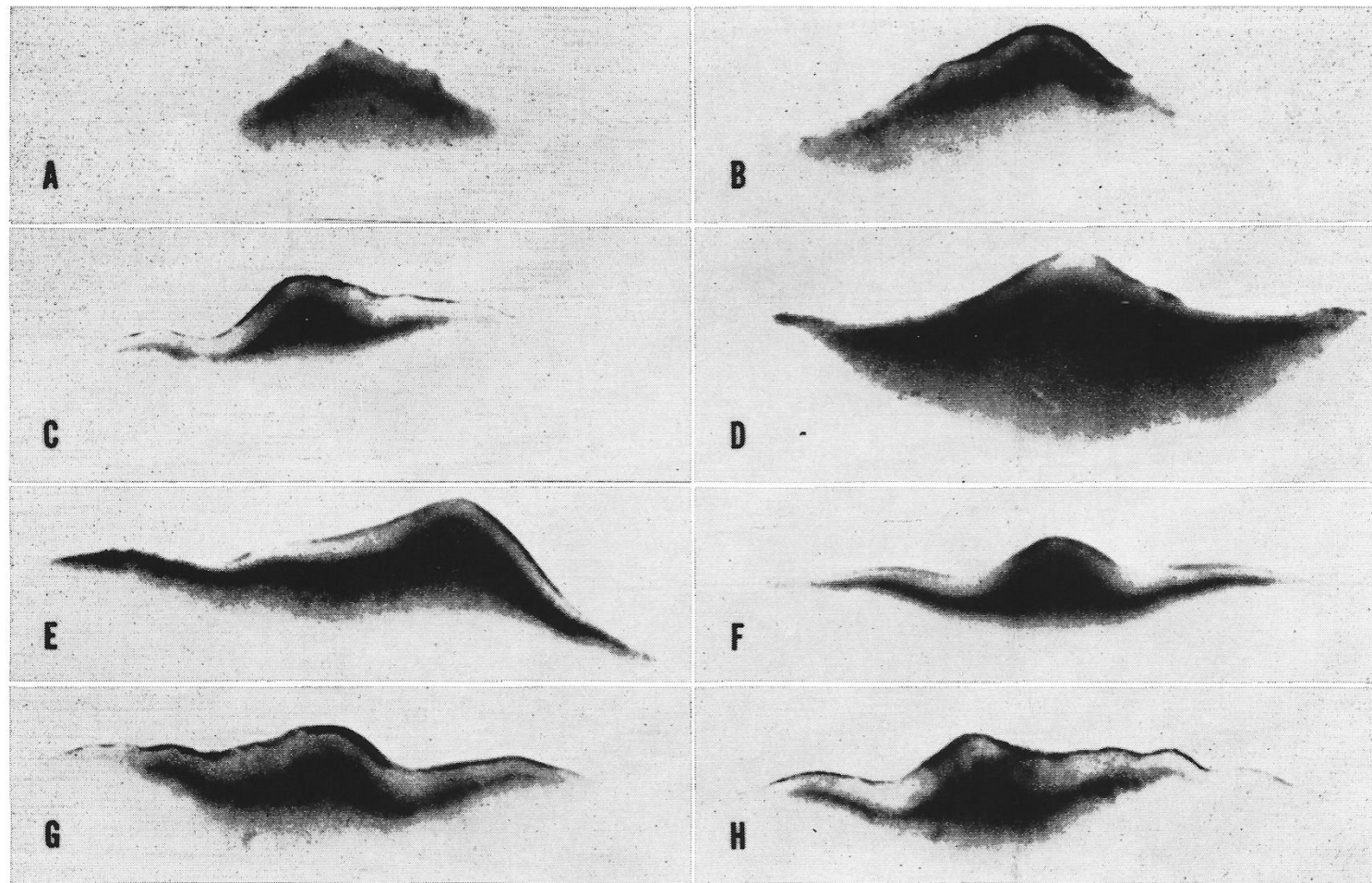
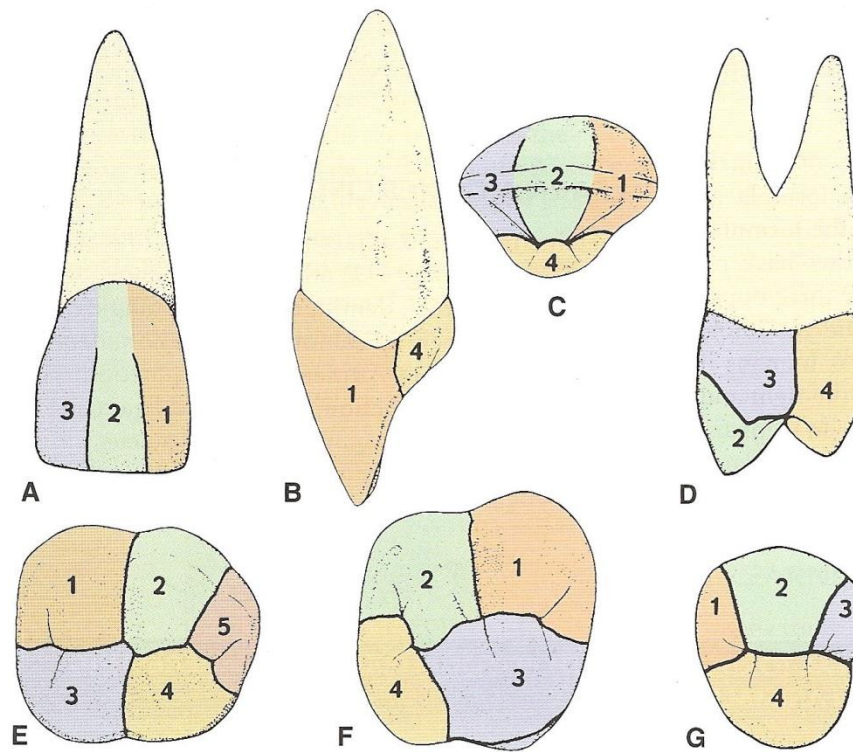


FIGURE 51. Eight stages in the progressive calcification of the maxillary central incisor. (Kraus, "Calcification of the Human Deciduous Teeth," courtesy of J.A.D.A., 59, 1128-1136.)



**FIGURE 1-45.** Lobes or primary anatomic divisions on teeth. Drawings A, B, and C show the facial, mesial, and incisal views of a maxillary central incisor that, like all *anterior teeth*, forms from *four lobes*. The lingual cingulum develops from one lobe (labeled 4) seen in views B and C. Mamelons may appear on the incisal edge of newly erupted incisors, an indication of the three labial lobes. Drawings D and G are the mesial and occlusal view of a *two-cusped premolar* that also forms from *four lobes*. As with anterior teeth, the facial cusp forms from three lobes, and one lingual lobe forms the lingual cusp. The divisions between the facial and lingual lobes are evidenced by the marginal ridge developmental grooves. **Each cusp of a molar is formed by one lobe.** Drawing E is a mandibular first molar with five lobes, three buccal, and two lingual, which is one lobe per cusp. Drawing F is a maxillary first molar with three larger lobes and one smaller lobe, or one per cusp. A very small fifth (Carabelli) cusp, when present, may form from a part of the large mesiolingual lobe, or may form from a separate lobe.

cusps (mandibular second), form from five lobes: three forming the facial cusp, and two forming the two lingual cusps (one lobe per cusp). Three very subtle vertical ridges separated by two subtle depressions provide evidence that three lobes form the facial surfaces of anterior teeth and premolars.

As a general rule, each **molar** cusp forms from one lobe. For example, maxillary or mandibular molars

with five cusps form from five lobes, and those with four cusps form from four lobes. Some maxillary molars have as few as three cusps and form from three lobes. Two types of tooth anomalies, peg-shaped maxillary lateral incisors and some extra teeth (also called supernumerary teeth), form from less than three lobes. Guidelines for determining the number of lobes that form each tooth are presented in *Table 1-5*.

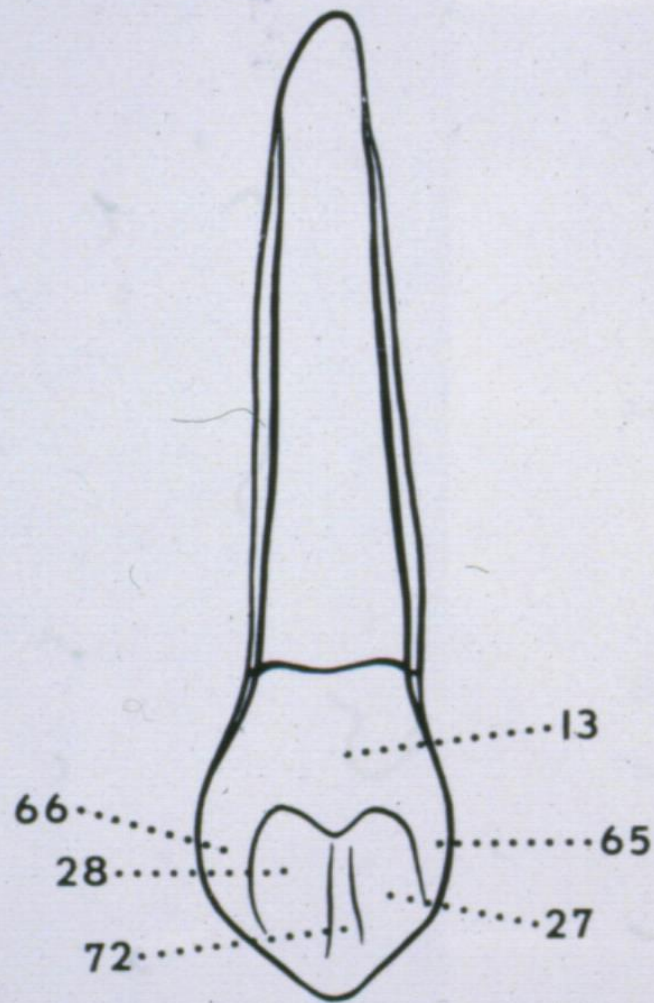


FIG. I-51. Maxillary left canine (lingual aspect)

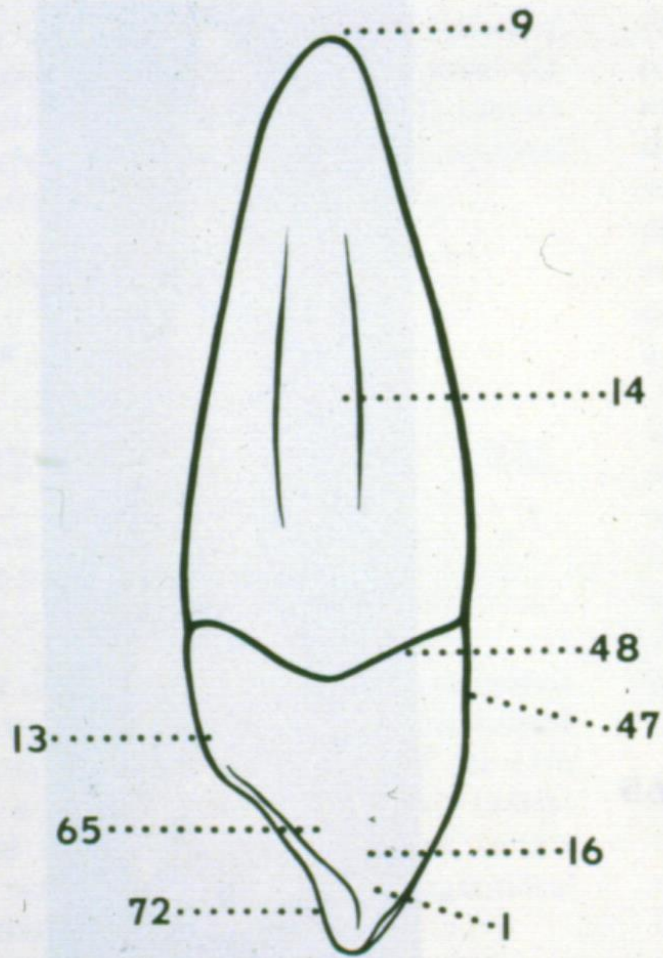


FIG. I-52. Maxillary left canine (mesial aspect)

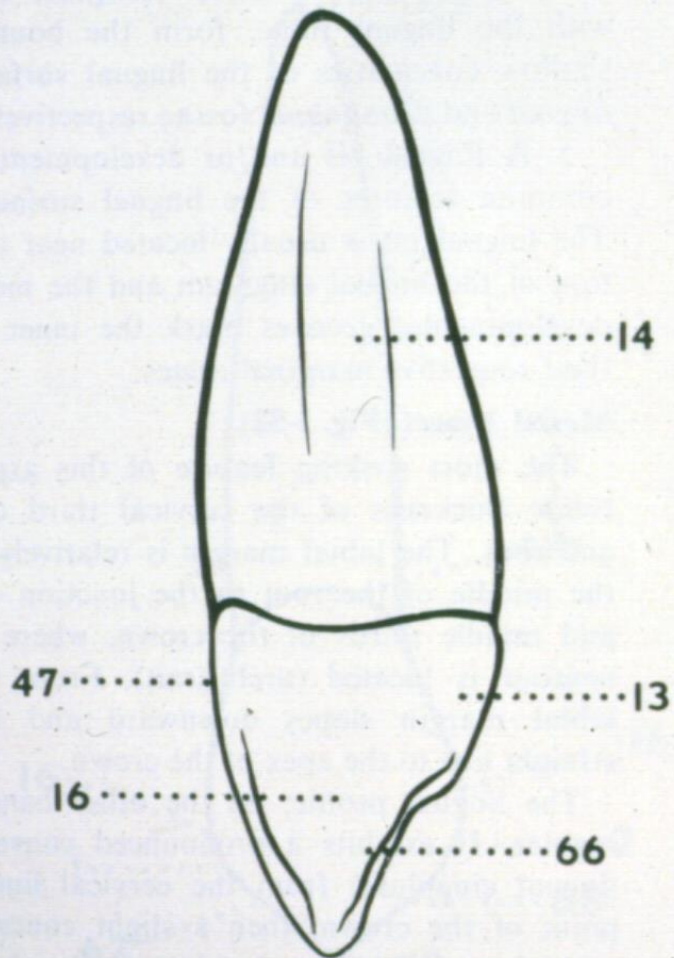
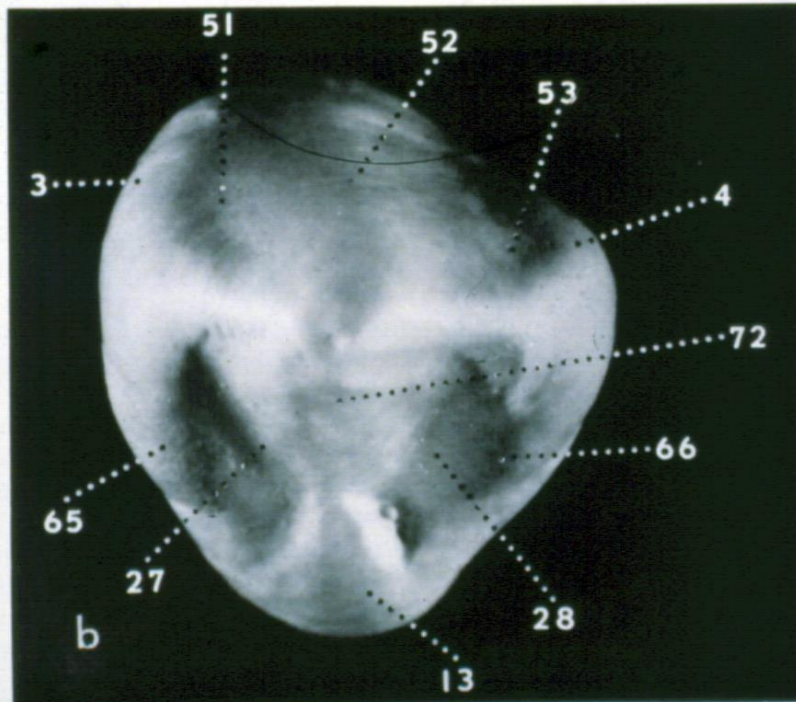


FIG. I-53. Maxillary left canine (distal aspect)



T D

C



B



A



0

1

2

3

4

5







# Mandibular Canine



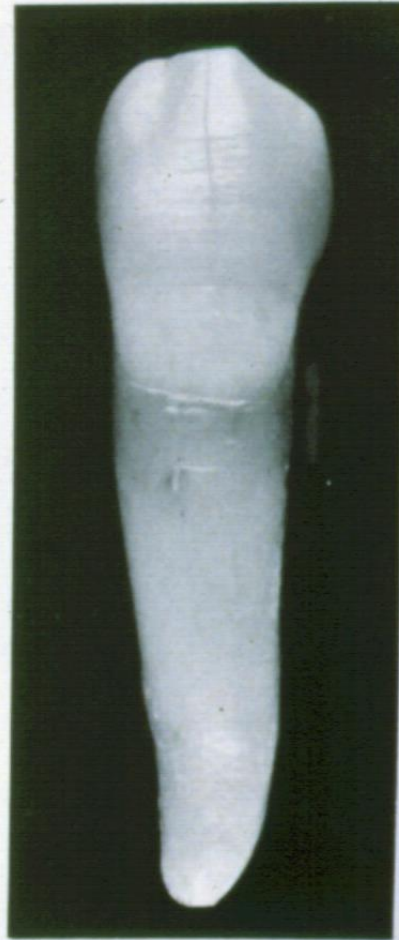
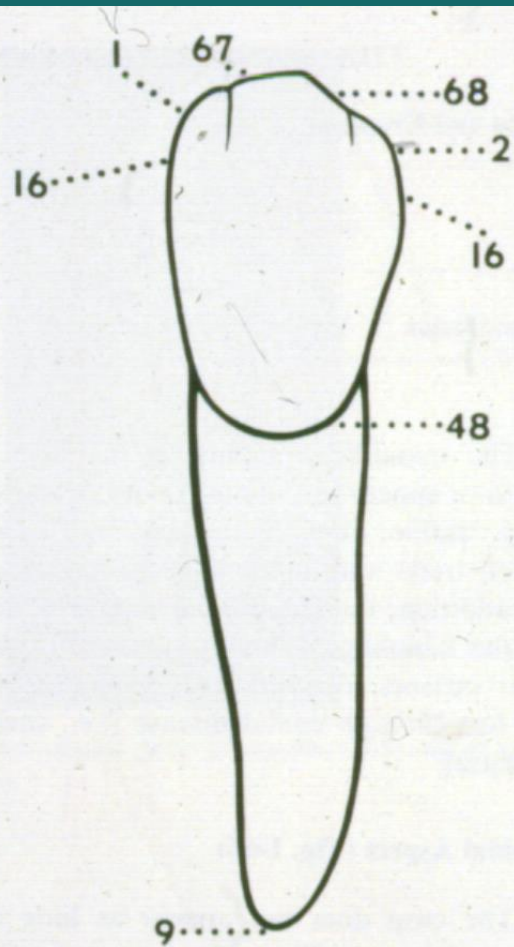


FIG. I-65. Mandibular left canine (labial aspect)

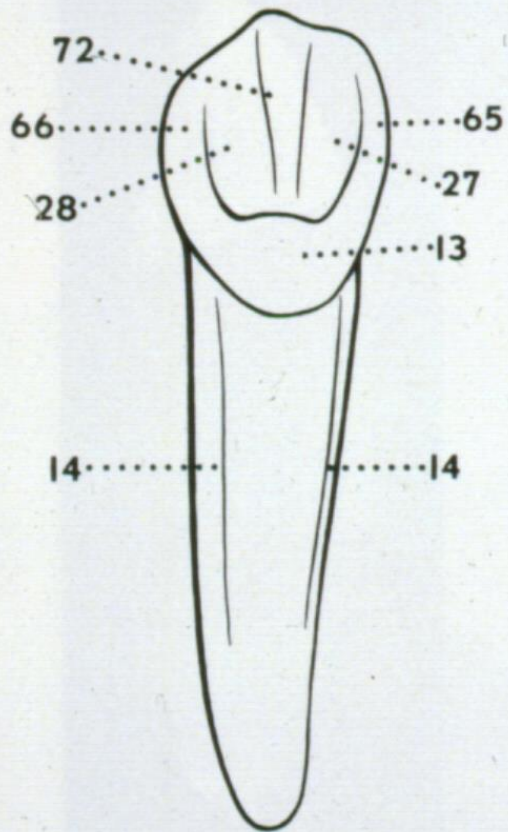


FIG. I-66. Mandibular left canine (lingual aspect)

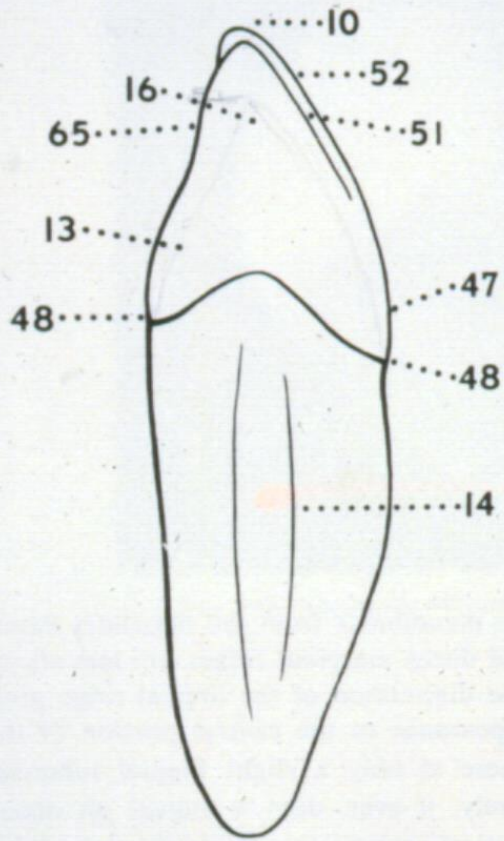


FIG. I-67. Mandibular left canine (mesial aspect)

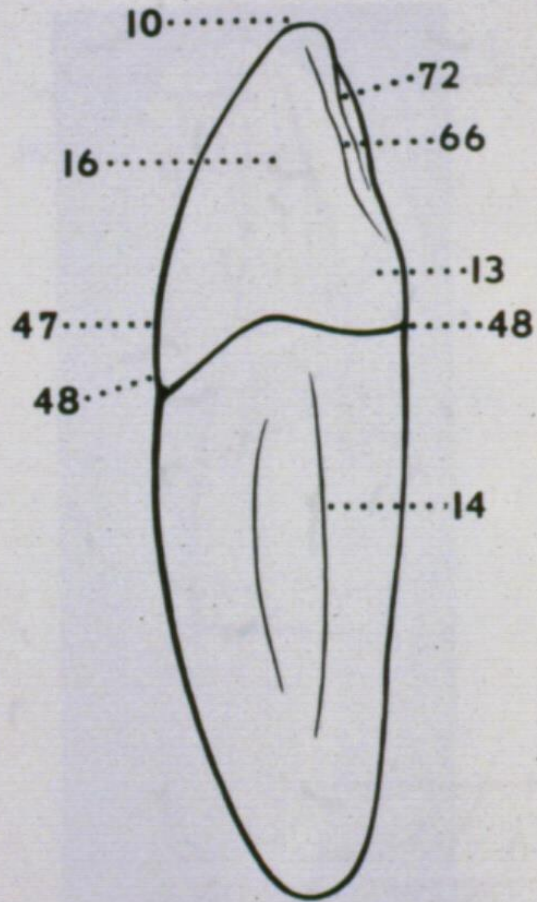


FIG. I-68. Mandibular left canine (distal aspect)

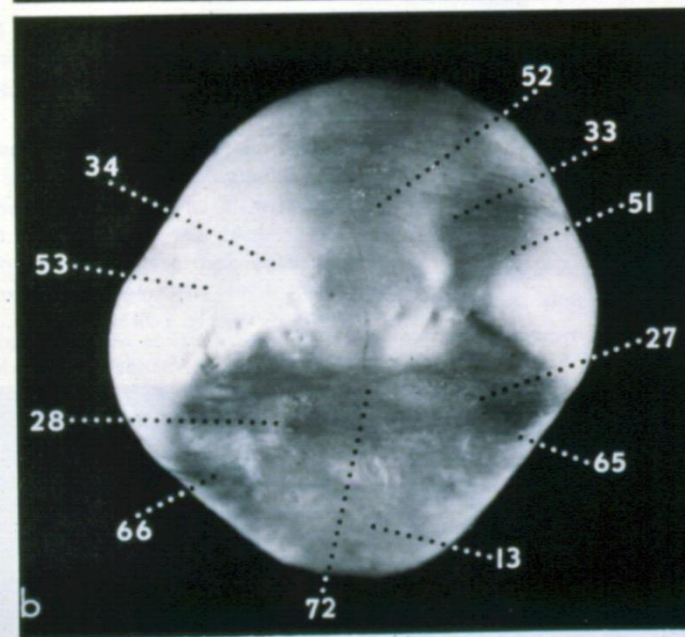
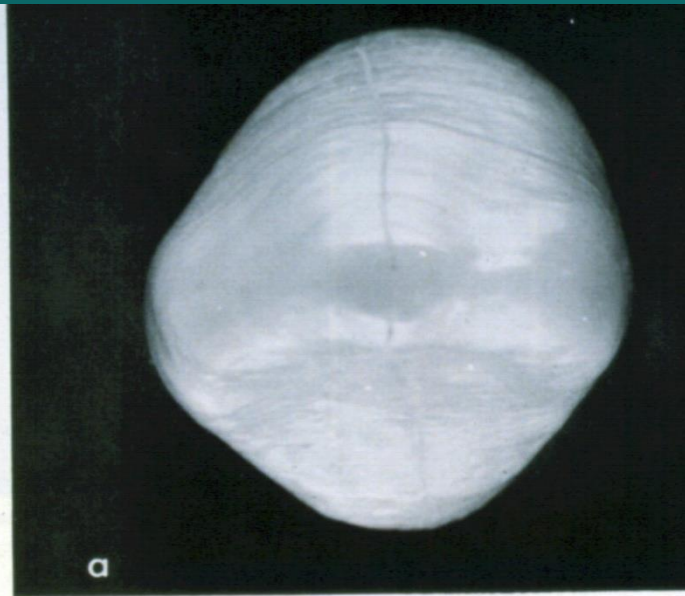


FIG. 1-69. Mandibular left canine (incisal aspect), *a*, actual crown; *b*, cast

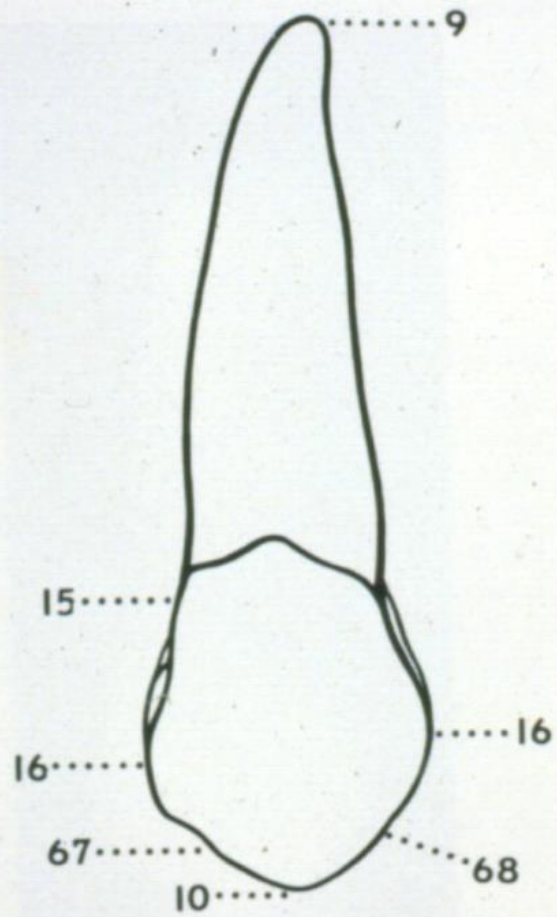


# Distal Accessory Ridge

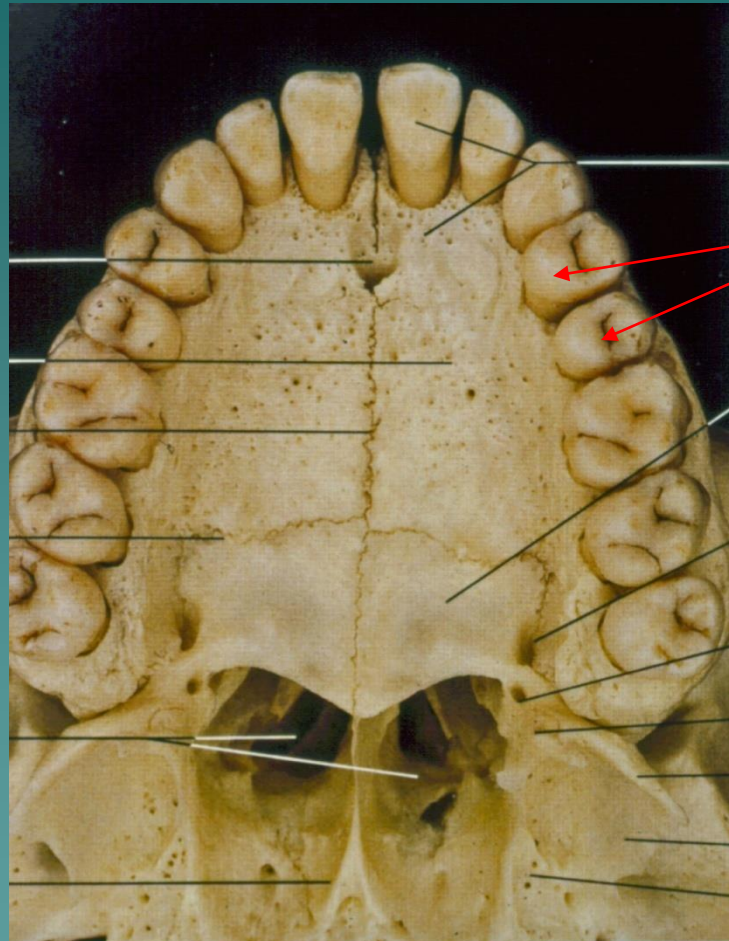








# Premolars

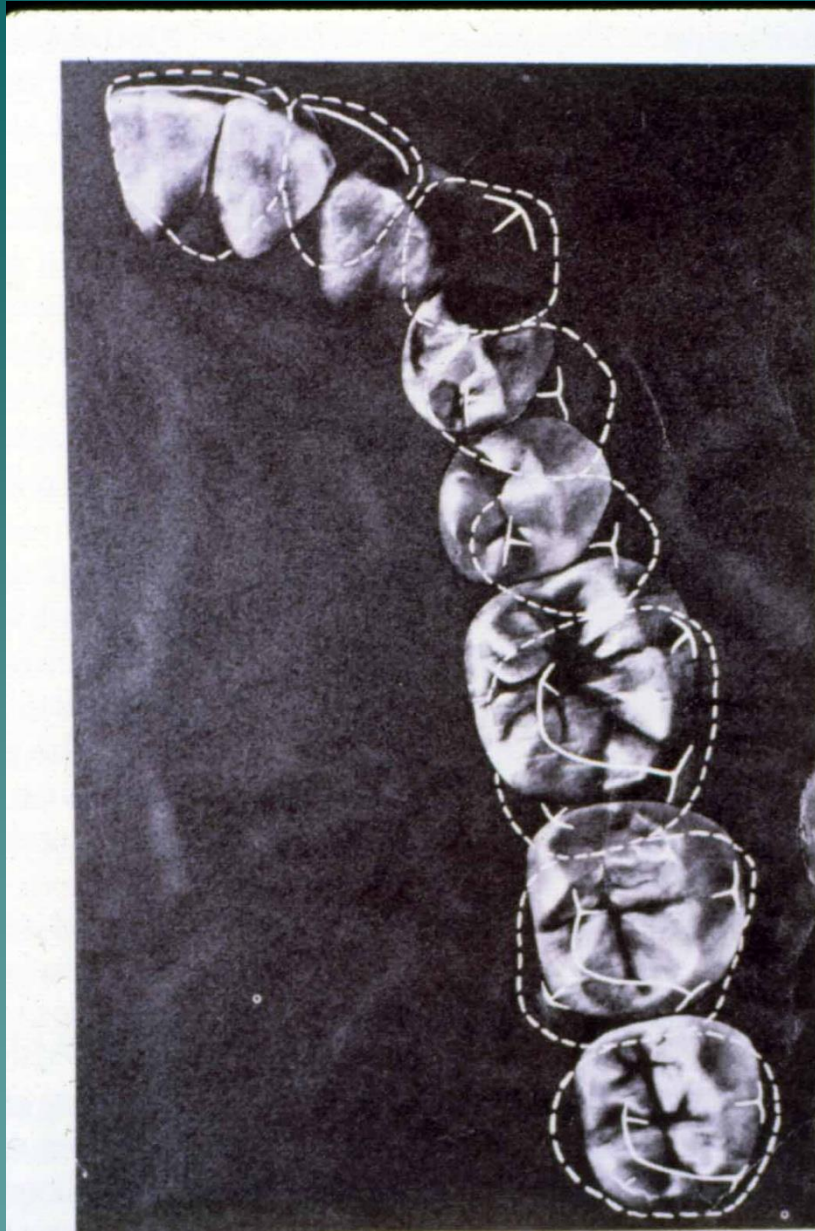


ony palate and teeth of the maxillae. From below.

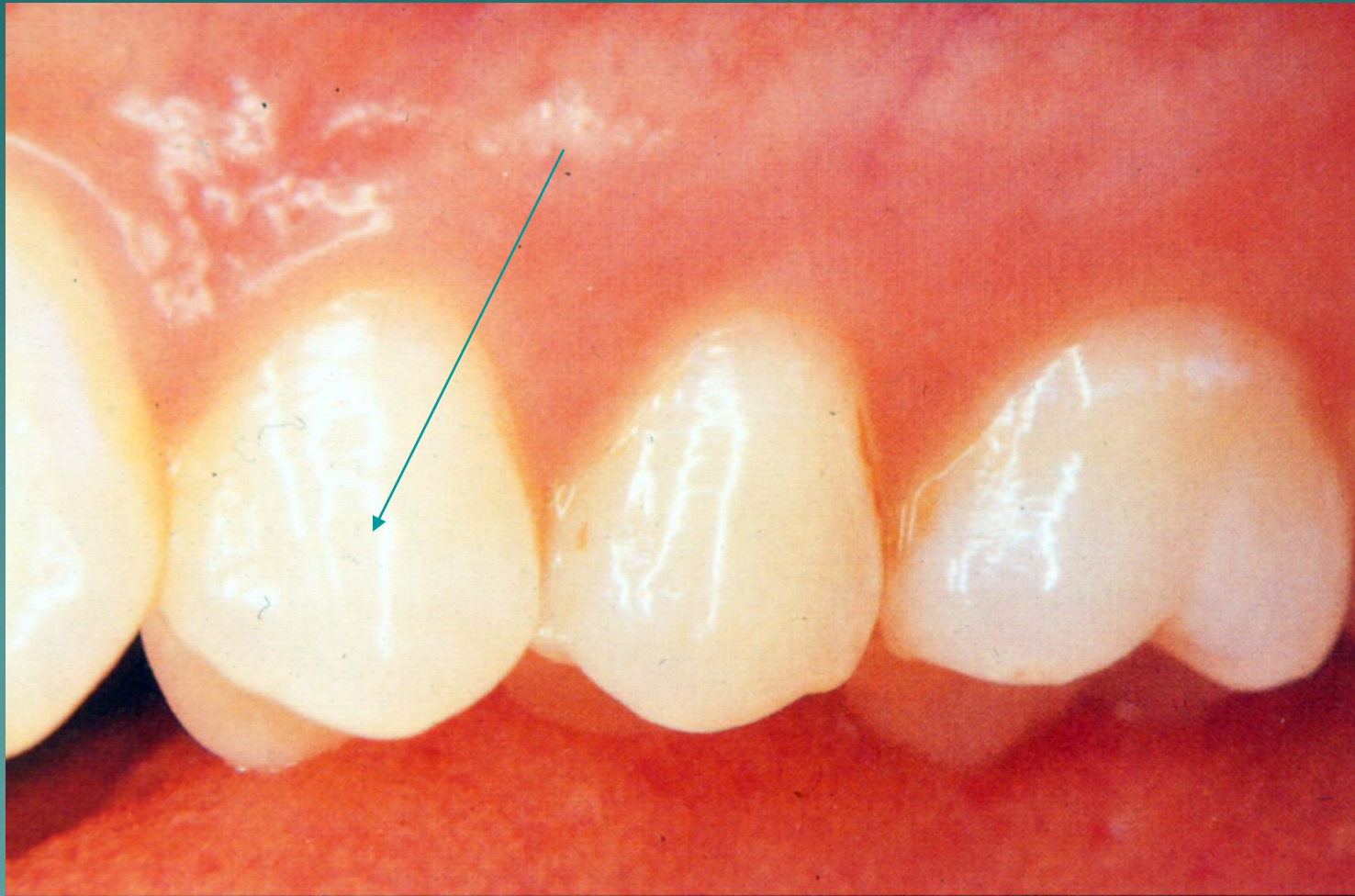
# Transitional teeth between canines and molars

- ◆ Like canine 1 sharp pointed cusp for piercing and cutting
- ◆ Like molars multicusped with broad surface for grinding





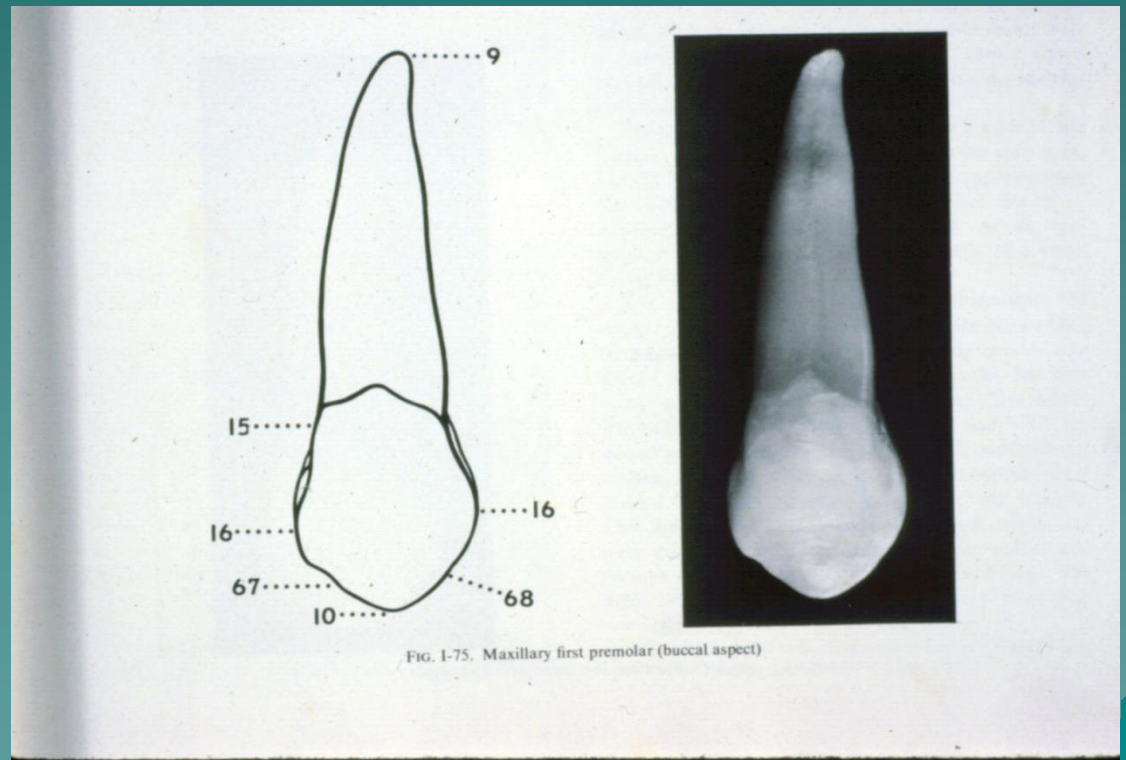
# 1<sup>st</sup> Maxillary Premolar





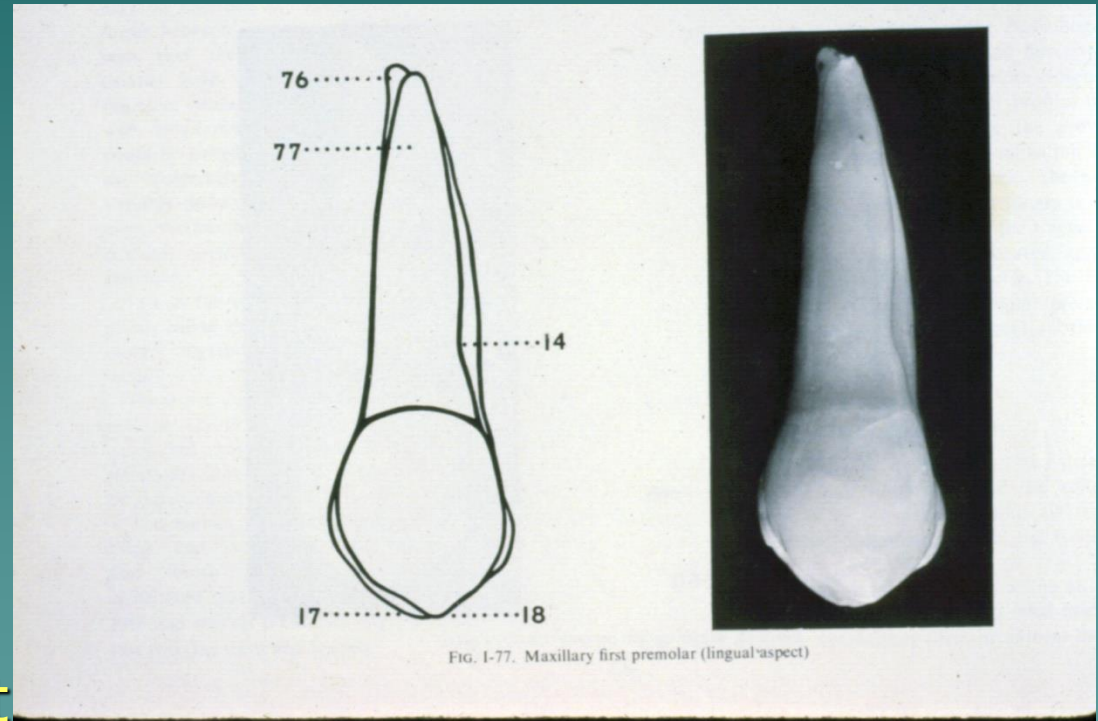
# First Maxillary Premolars

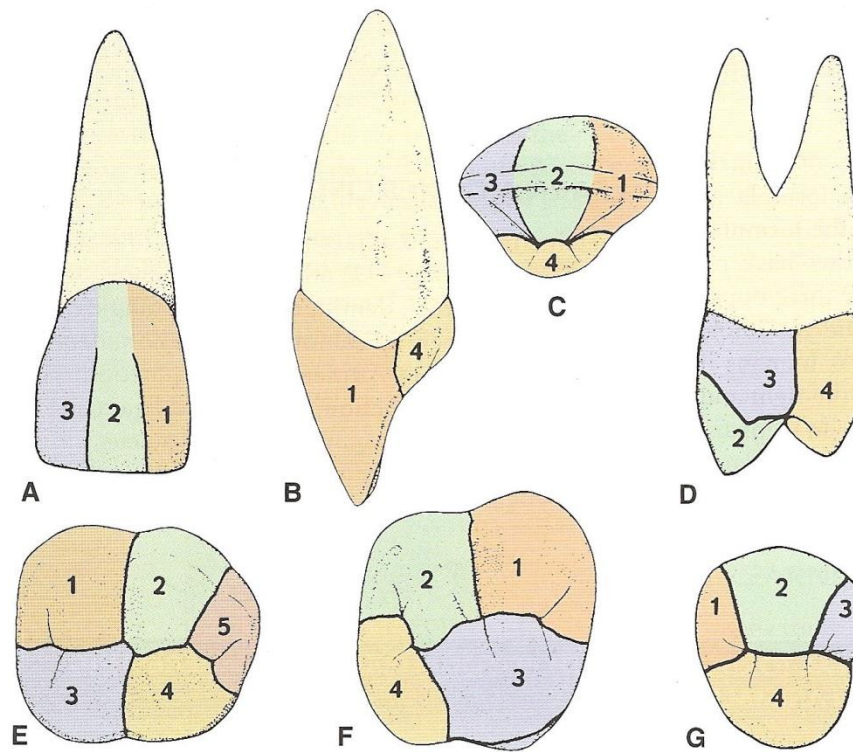
- ◆ Mesial concavity
- ◆ Mesial cusp ridge
- ◆ Distal cusp ridge
- ◆ Buccal ridge
- ◆ Three lobes



# Lingual – 1<sup>st</sup> Maxillary

- ◆ Proximal root concavity – 14
- ◆ Lingual cusp smaller than buccal
- ◆ Cusp located mesial of midline
- ◆ Lingual cusp not 3 lobed





**FIGURE 1-45.** Lobes or primary anatomic divisions on teeth. Drawings A, B, and C show the facial, mesial, and incisal views of a maxillary central incisor that, like all *anterior teeth*, forms from *four* lobes. The lingual cingulum develops from one lobe (labeled 4) seen in views B and C. Mamelons may appear on the incisal edge of newly erupted incisors, an indication of the three labial lobes. Drawings D and G are the mesial and occlusal view of a *two-cusped premolar* that also forms from *four* lobes. As with anterior teeth, the facial cusp forms from three lobes, and one lingual lobe forms the lingual cusp. The divisions between the facial and lingual lobes are evidenced by the marginal ridge developmental grooves. **Each cusp of a molar is formed by one lobe.** Drawing E is a mandibular first molar with five lobes, three buccal, and two lingual, which is one lobe per cusp. Drawing F is a maxillary first molar with three larger lobes and one smaller lobe, or one per cusp. A very small fifth (Carabelli) cusp, when present, may form from a part of the large mesiolingual lobe, or may form from a separate lobe.

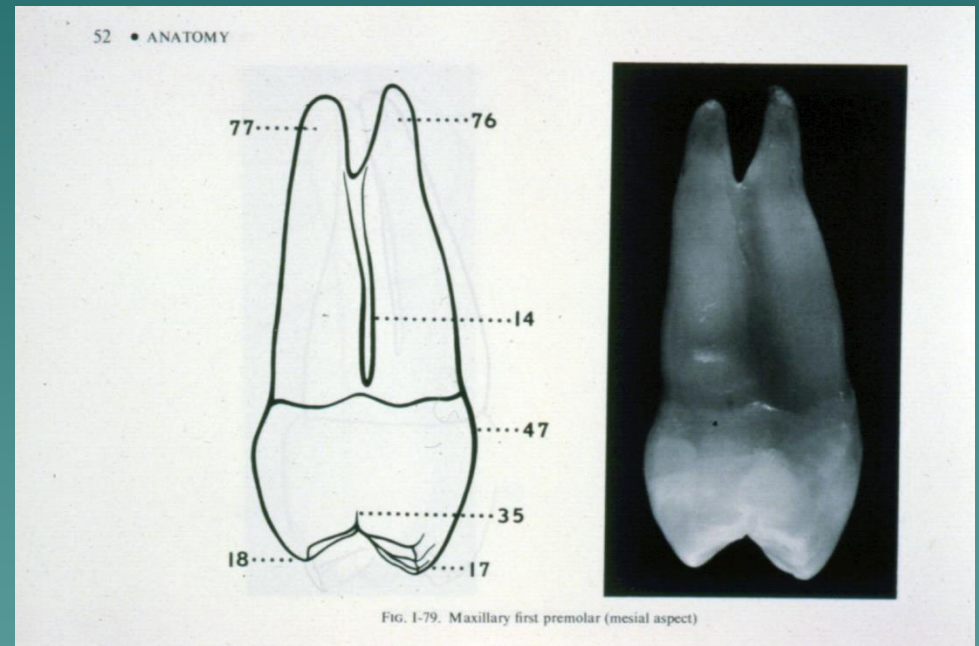
cusps (mandibular second), form from five lobes: three forming the facial cusp, and two forming the two lingual cusps (one lobe per cusp). Three very subtle vertical ridges separated by two subtle depressions provide evidence that three lobes form the facial surfaces of anterior teeth and premolars.

As a general rule, each **molar** cusp forms from one lobe. For example, maxillary or mandibular molars

with five cusps form from five lobes, and those with four cusps form from four lobes. Some maxillary molars have as few as three cusps and form from three lobes. Two types of tooth anomalies, peg-shaped maxillary lateral incisors and some extra teeth (also called supernumerary teeth), form from less than three lobes. Guidelines for determining the number of lobes that form each tooth are presented in *Table 1-5*.

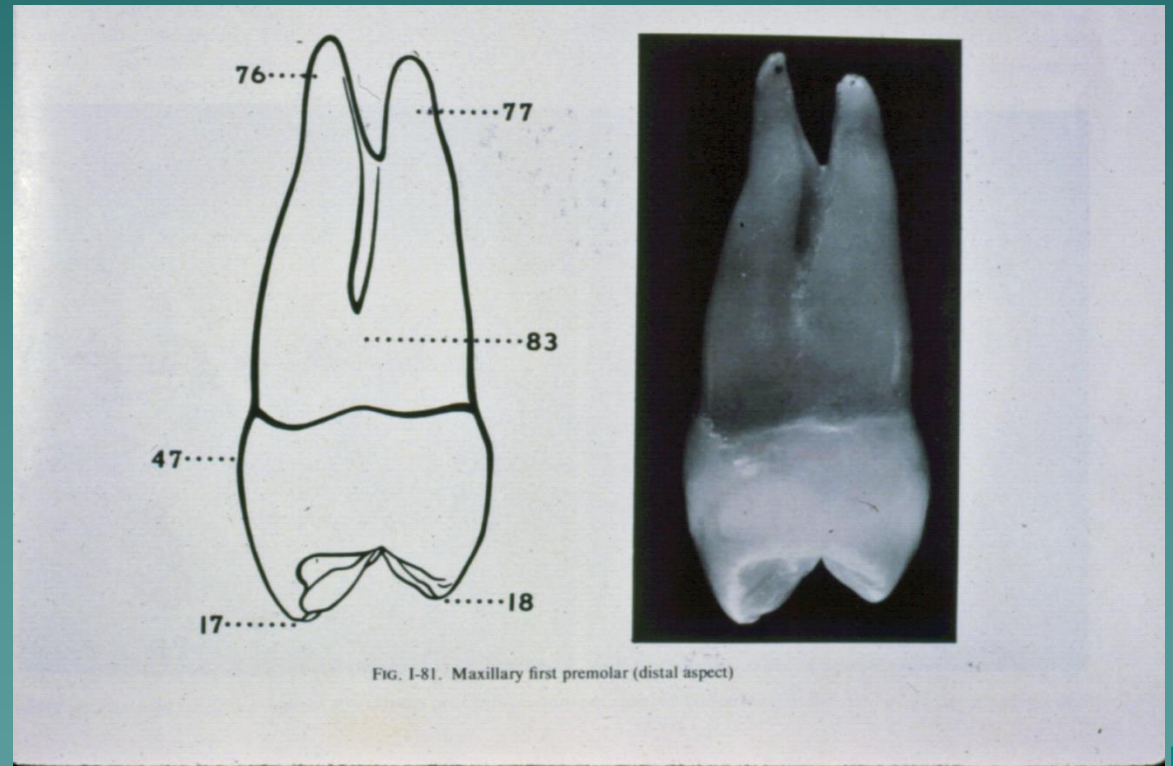
# Mesial View – 1<sup>st</sup> Maxillary Premolar

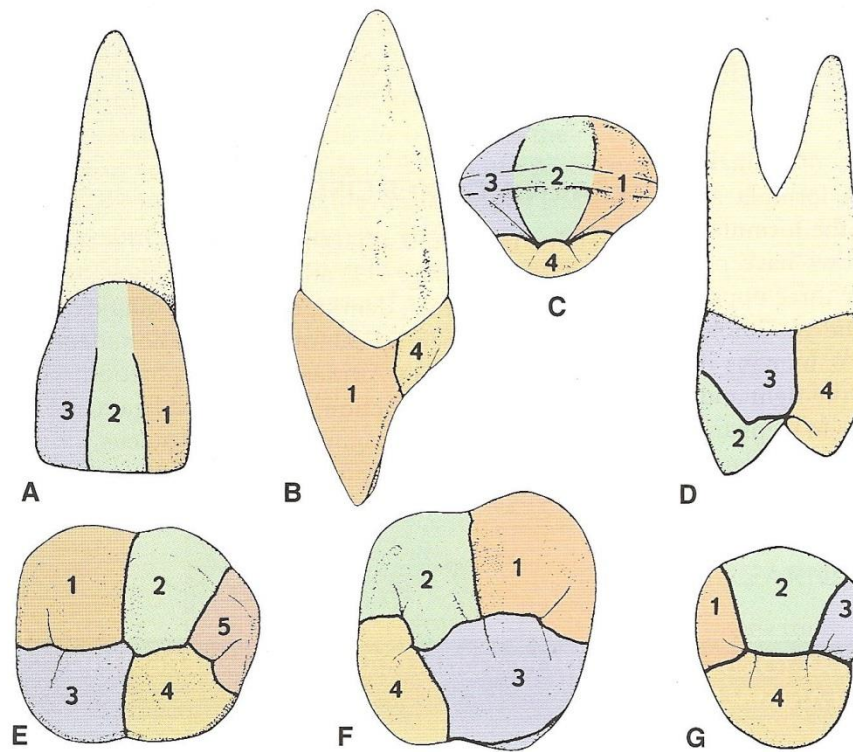
- ◆ B cusp higher
- ◆ Mesial marginal groove 35
- ◆ Mesial concavity becomes mesial interradicular groove on root
- ◆ 2 roots – buccal &



# Distal View – 1<sup>st</sup> Maxillary Premolar

- ◆ No marginal groove
- ◆ No distal concavity
- ◆ Distal interradicular groove less pronounced





**FIGURE 1-45.** Lobes or primary anatomic divisions on teeth. Drawings A, B, and C show the facial, mesial, and incisal views of a maxillary central incisor that, like all *anterior teeth*, forms from *four* lobes. The lingual cingulum develops from one lobe (labeled 4) seen in views B and C. Mamelons may appear on the incisal edge of newly erupted incisors, an indication of the three labial lobes. Drawings D and G are the mesial and occlusal view of a *two-cusped premolar* that also forms from *four* lobes. As with anterior teeth, the facial cusp forms from three lobes, and one lingual lobe forms the lingual cusp. The divisions between the facial and lingual lobes are evidenced by the marginal ridge developmental grooves. **Each cusp of a molar is formed by one lobe.** Drawing E is a mandibular first molar with five lobes, three buccal, and two lingual, which is one lobe per cusp. Drawing F is a maxillary first molar with three larger lobes and one smaller lobe, or one per cusp. A very small fifth (Carabelli) cusp, when present, may form from a part of the large mesiolingual lobe, or may form from a separate lobe.

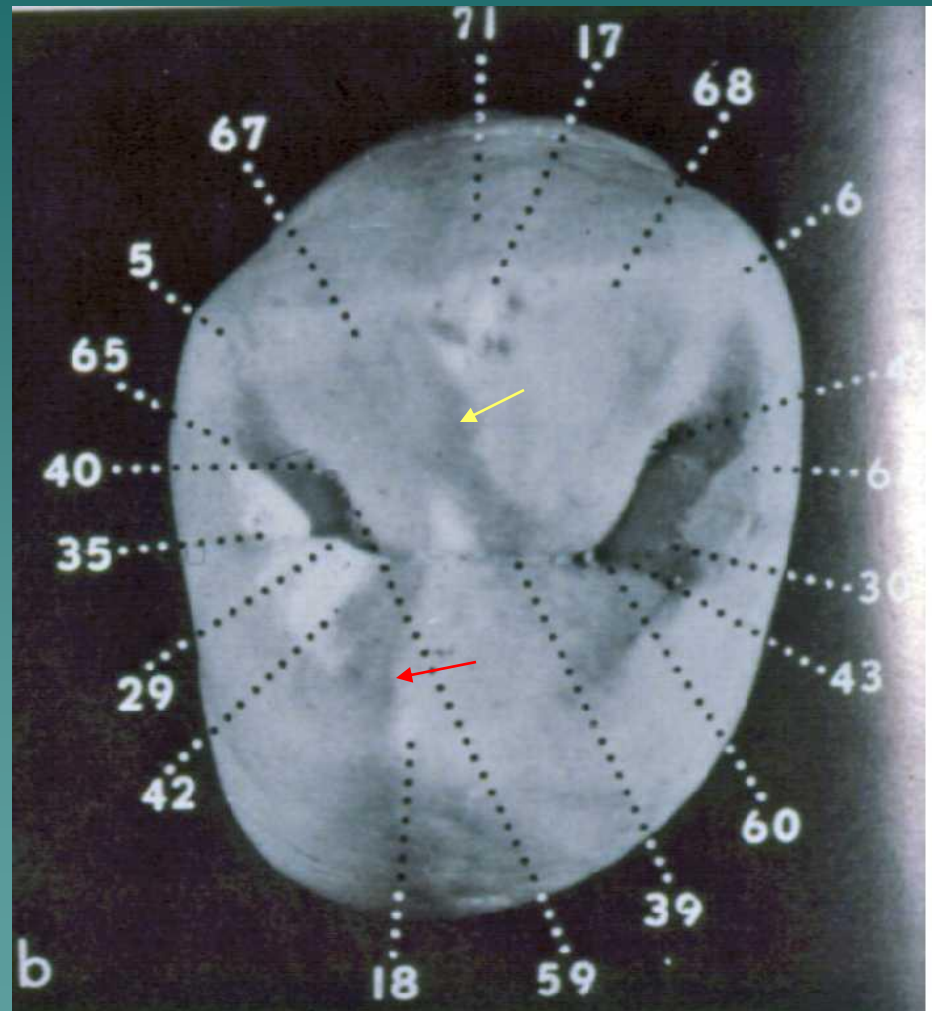
cusps (mandibular second), form from five lobes: three forming the facial cusp, and two forming the two lingual cusps (one lobe per cusp). Three very subtle vertical ridges separated by two subtle depressions provide evidence that three lobes form the facial surfaces of anterior teeth and premolars.

As a general rule, each **molar** cusp forms from one lobe. For example, maxillary or mandibular molars

with five cusps form from five lobes, and those with four cusps form from four lobes. Some maxillary molars have as few as three cusps and form from three lobes. Two types of tooth anomalies, peg-shaped maxillary lateral incisors and some extra teeth (also called supernumerary teeth), form from less than three lobes. Guidelines for determining the number of lobes that form each tooth are presented in *Table 1-5*.

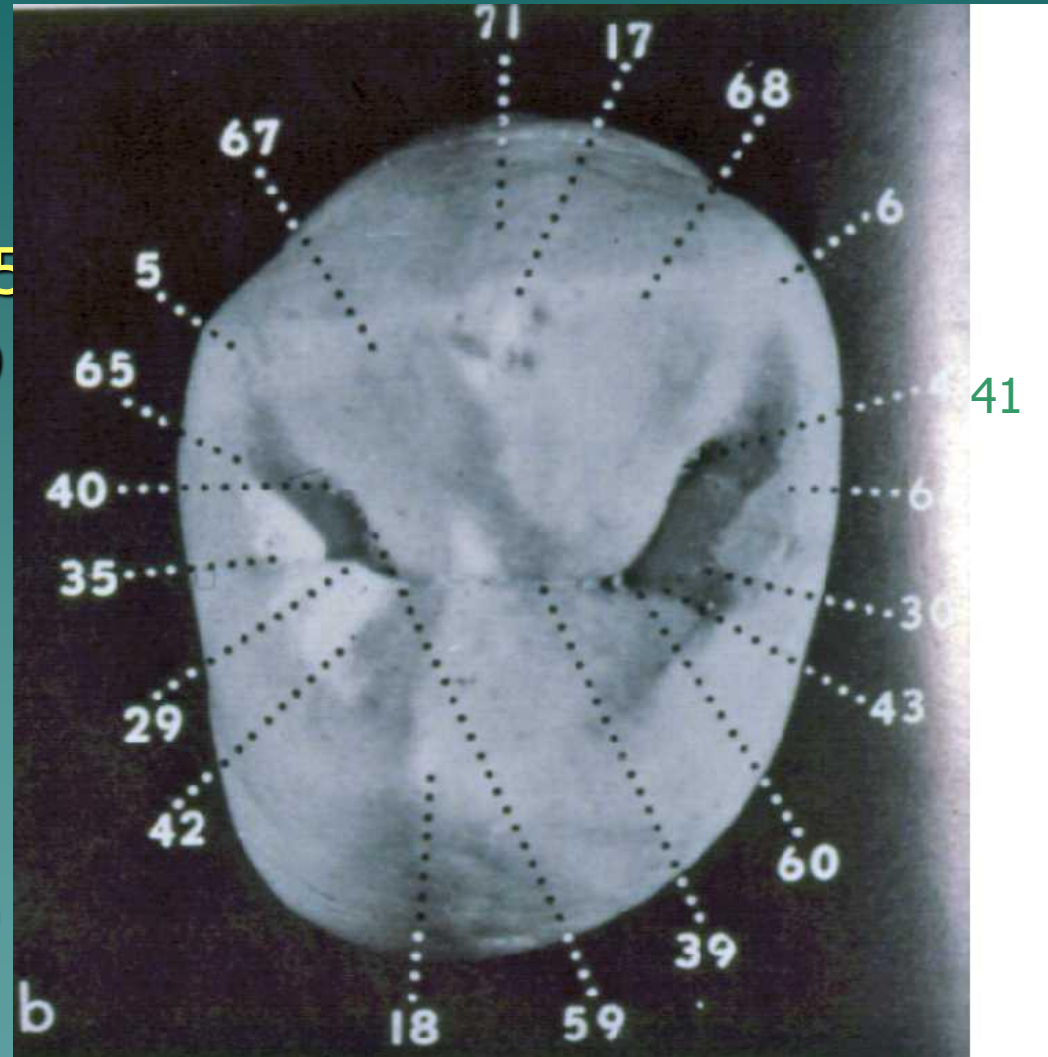
# Occlusal – 1<sup>st</sup> Maxillary Premolar

- ◆ Buccal cusp 17
- ◆ Buccal ridge 71
- ◆ M-B angle 5
- ◆ D-B angle 6
- ◆ B triangular ridge
- ◆ L cusp 18
- ◆ L triangular ridge



# 1<sup>st</sup> Maxillary Premolar - Grooves

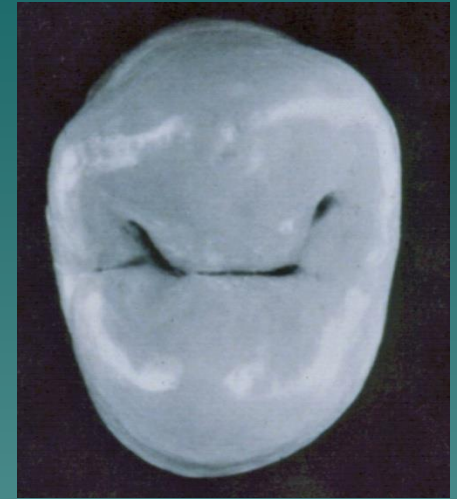
- ◆ MB Groove 40
- ◆ M marginal ridge
- ◆ M marginal groove 35
- ◆ M triangular fossa 29
- ◆ M L groove 42
- ◆ Central groove 39
- ◆ D L groove 43
- ◆ D B groove 41
- ◆ D Marginal ridge
- ◆ D triangular fossa 30

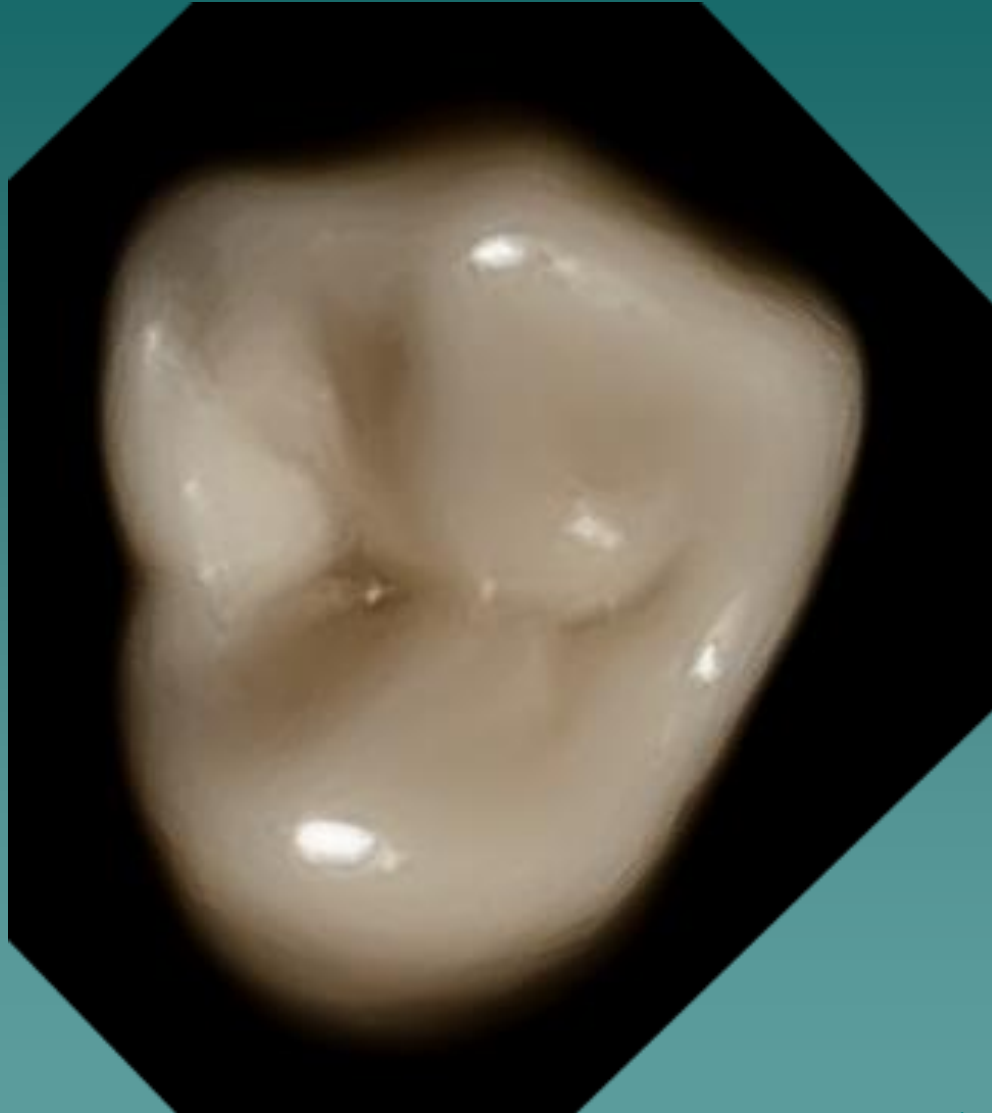




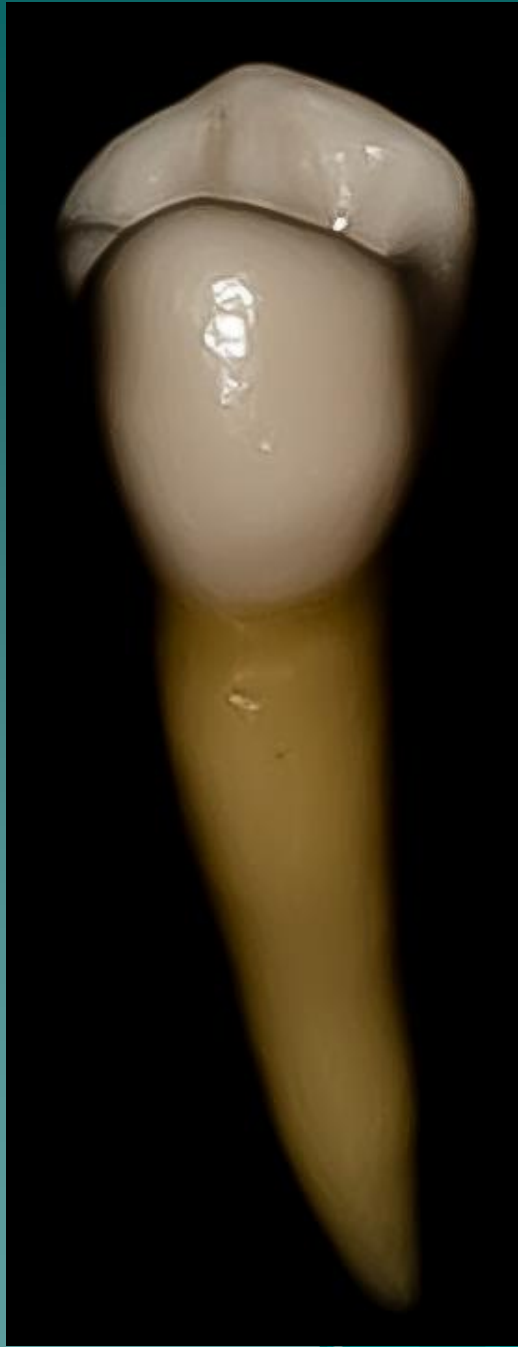
# 1<sup>st</sup> Maxillary Premolar

- ◆ Crown roughly hexagonal
- ◆ MB and DL angles widest
- ◆ B cusp biggest
- ◆ B ridge shows 3 lobe cusp
- ◆ L cusp no ridge or depressions – no lobes
- ◆ B and L triangular ridges – each cusp 3 ridges
- ◆ Central groove separates 2 cusps
- ◆ C groove terminates in M & D triangular fossae



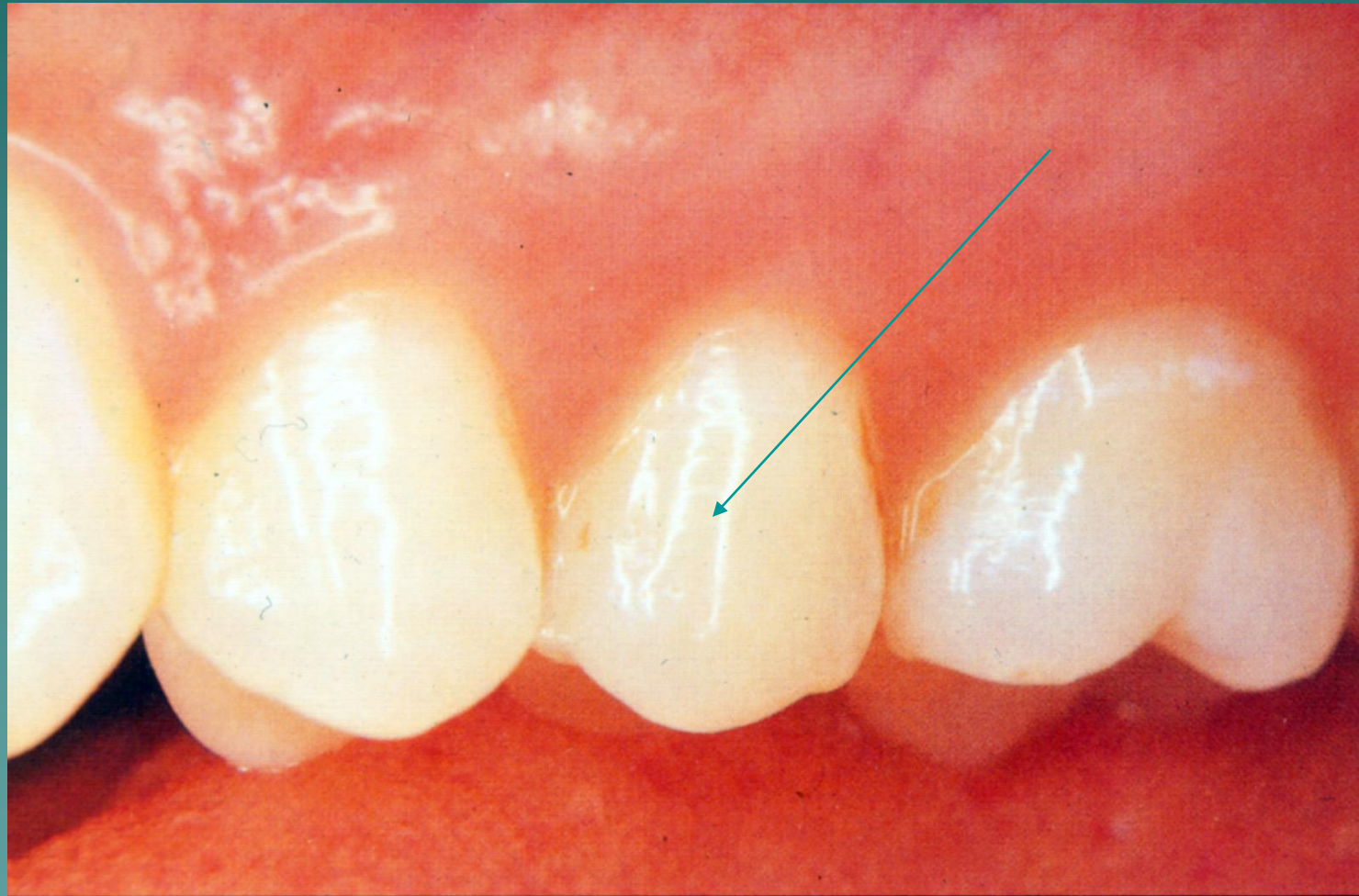






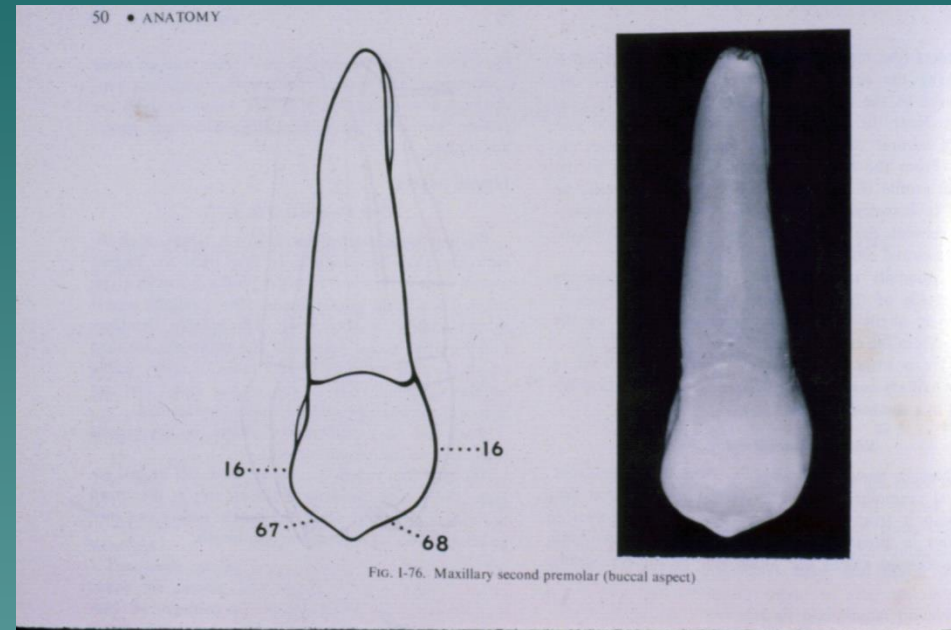


# 2<sup>nd</sup> Maxillary Premolar



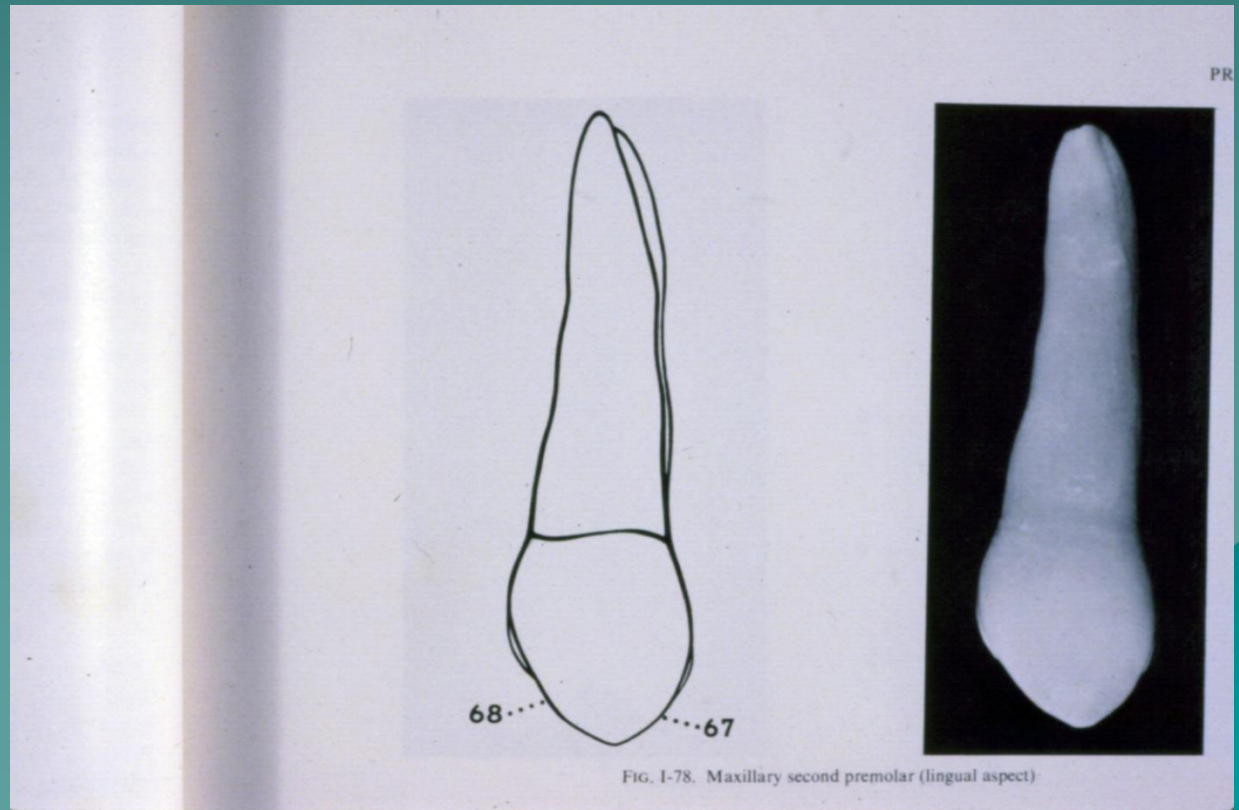
# 2<sup>nd</sup> Maxillary Premolar

- ◆ B view similar to 1<sup>st</sup>
- ◆ Except:
- ◆ Crown smaller
- ◆ Narrower at top rather than ovoid
- ◆ M concavity less pronounced



# Lingual View – 2<sup>nd</sup> Max PM

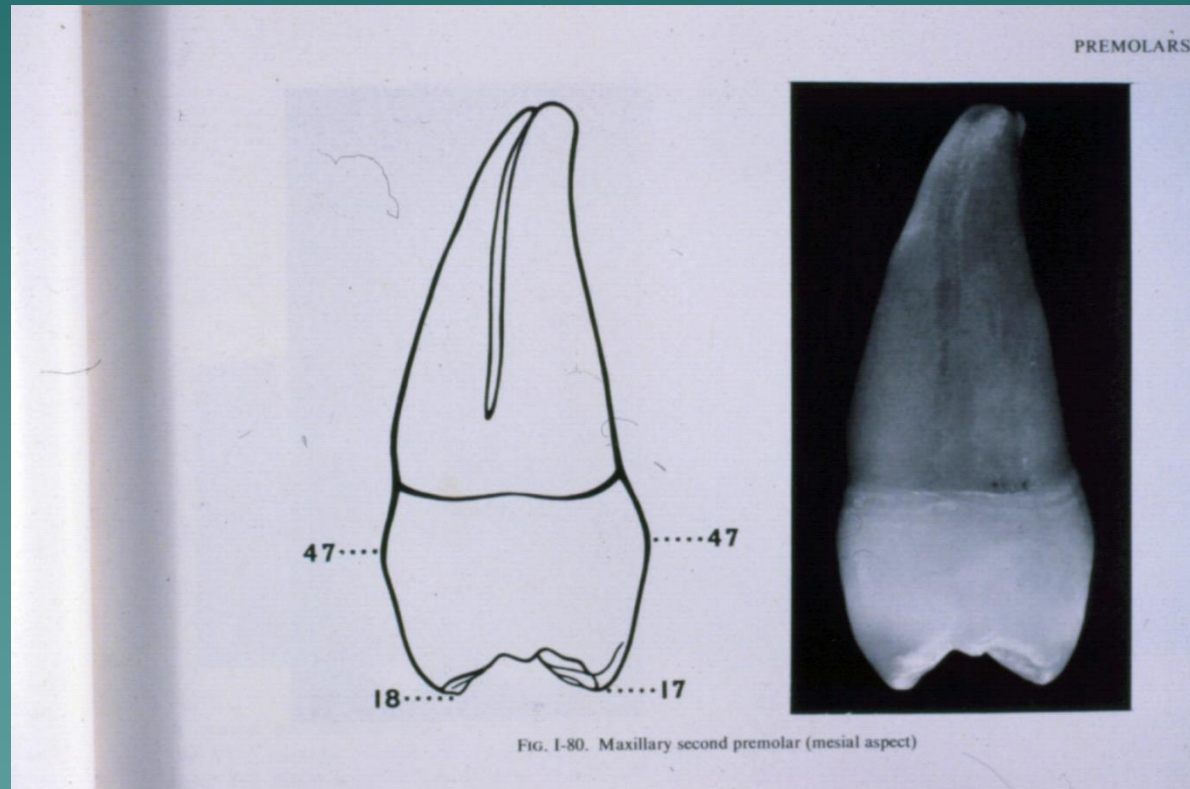
- ◆ Similar to 1<sup>st</sup> except
- ◆ 2 cusps almost equal





# M View 2<sup>nd</sup> Max PM

- ◆ No mesial marginal groove
- ◆ Similar to 1<sup>st</sup> except cusps of equal height



# 2<sup>nd</sup> Max PM

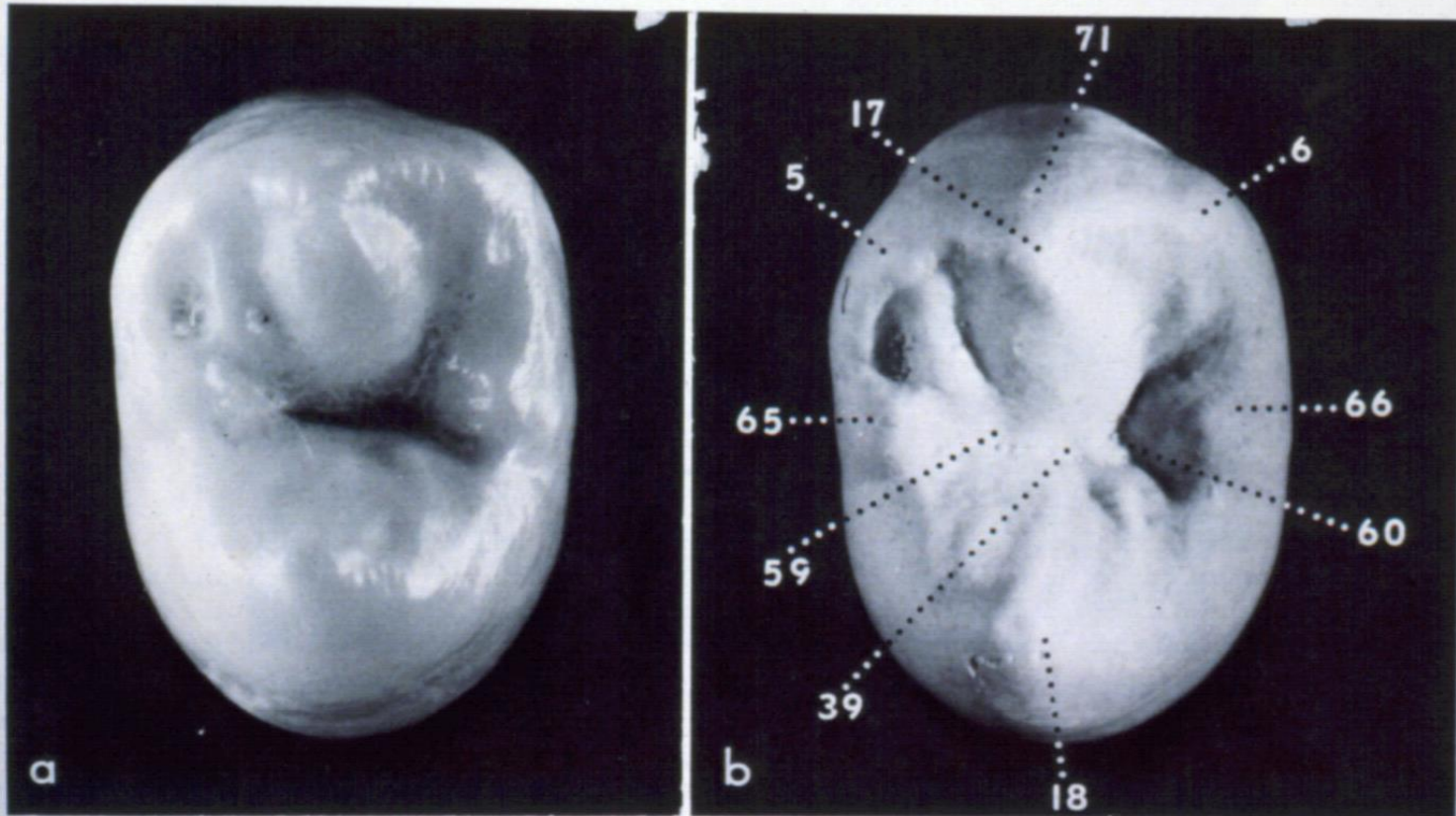
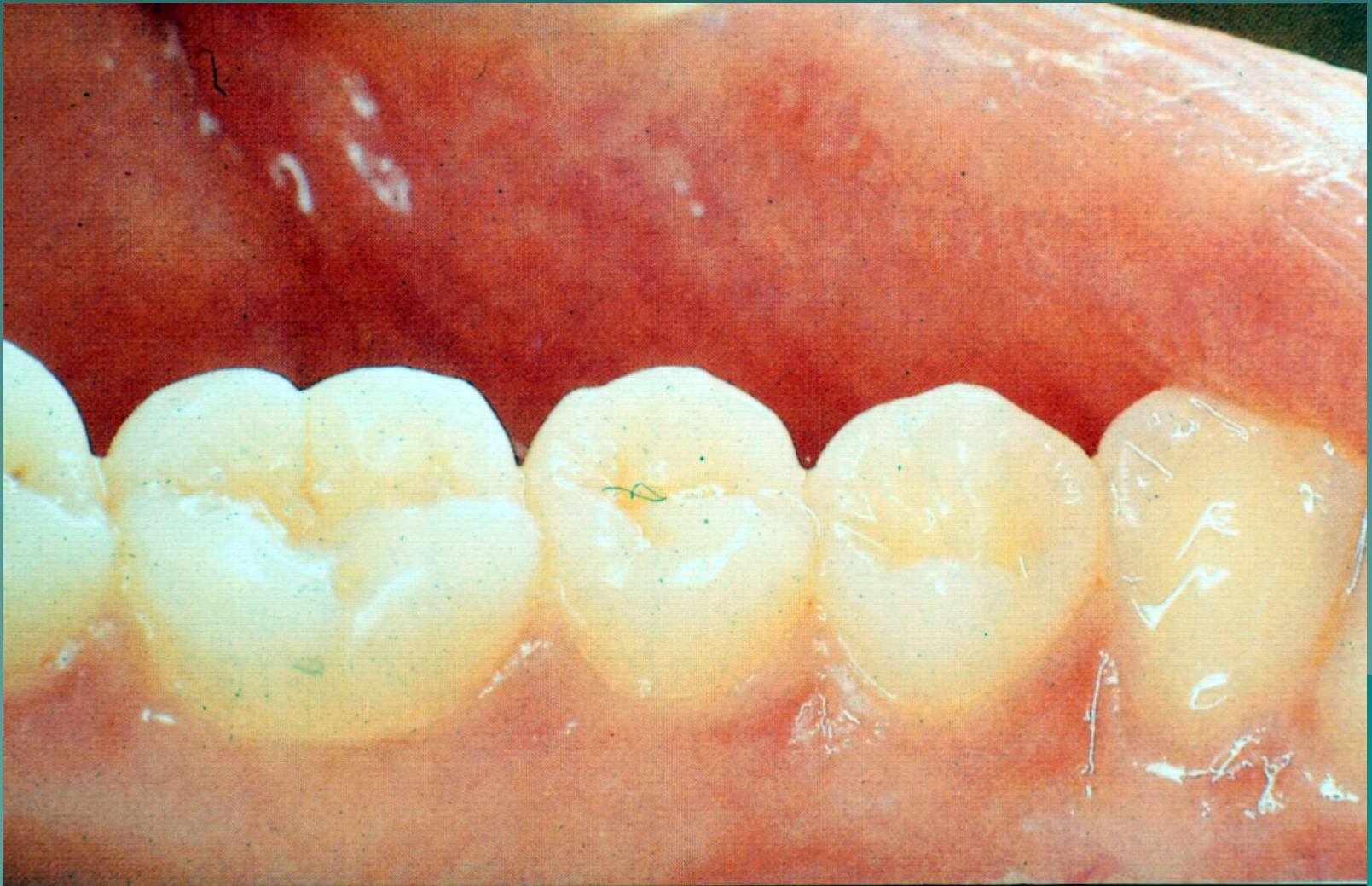


FIG. I-84. Maxillary second premolar (occlusal aspect). *a*, actual crown; *b*, cast

Man PM different from Max and  
different from each other

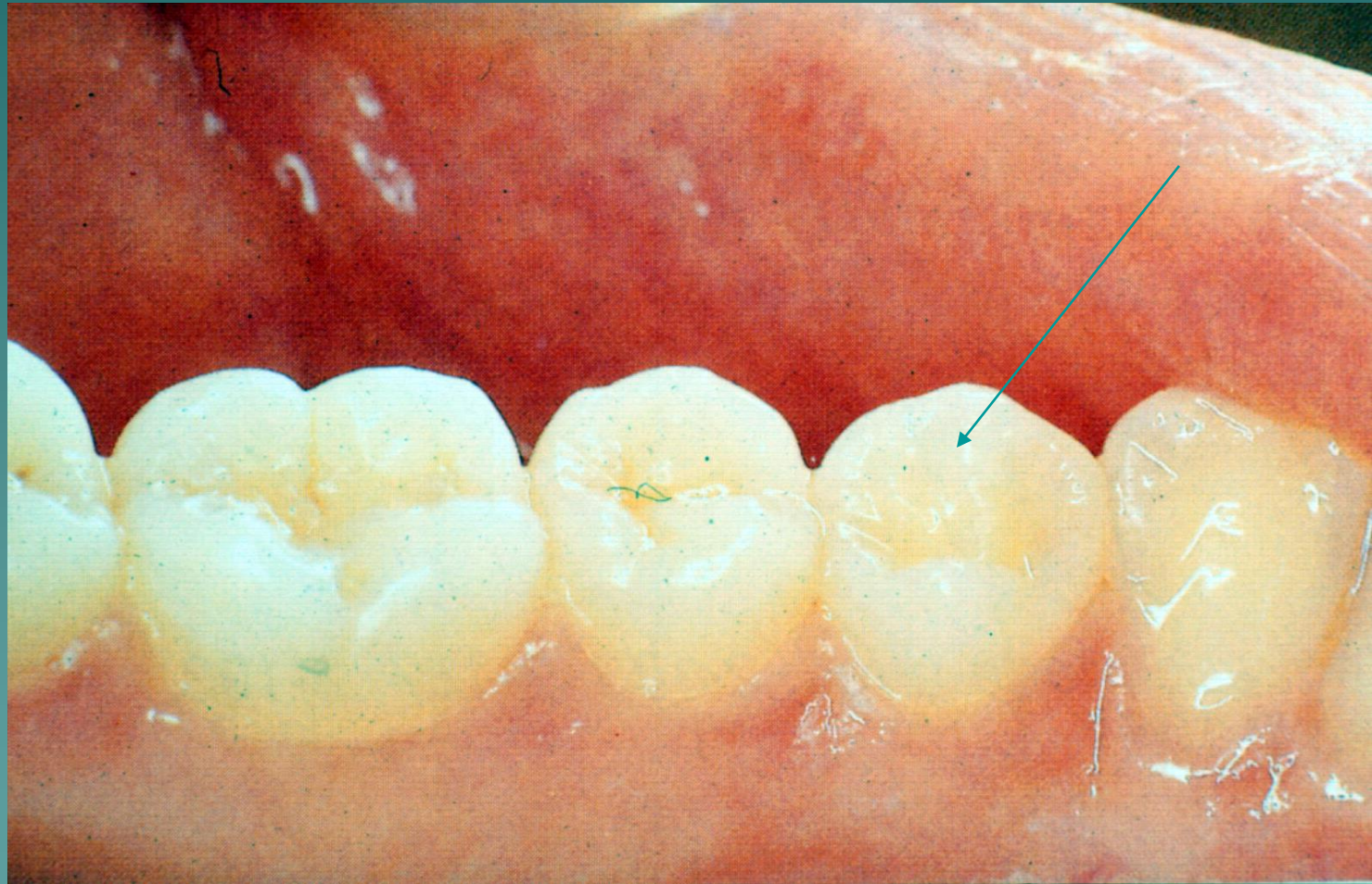


# Man PM

- ◆ 1<sup>st</sup> similar to canine – large simple cone
- ◆ 2<sup>nd</sup> similar to molar – multiple cusps



# 1<sup>st</sup> Mandibular Premolar



# 1<sup>st</sup> Man PM

62 • ANATOMY

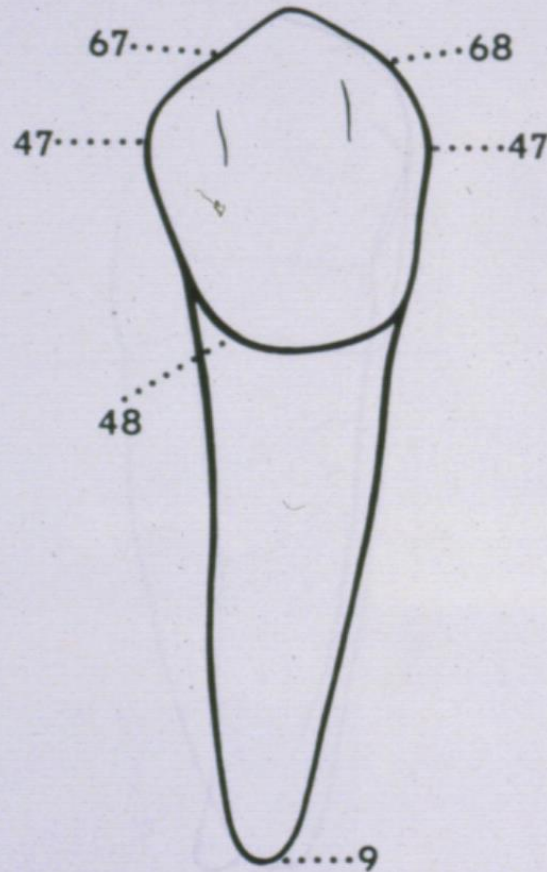
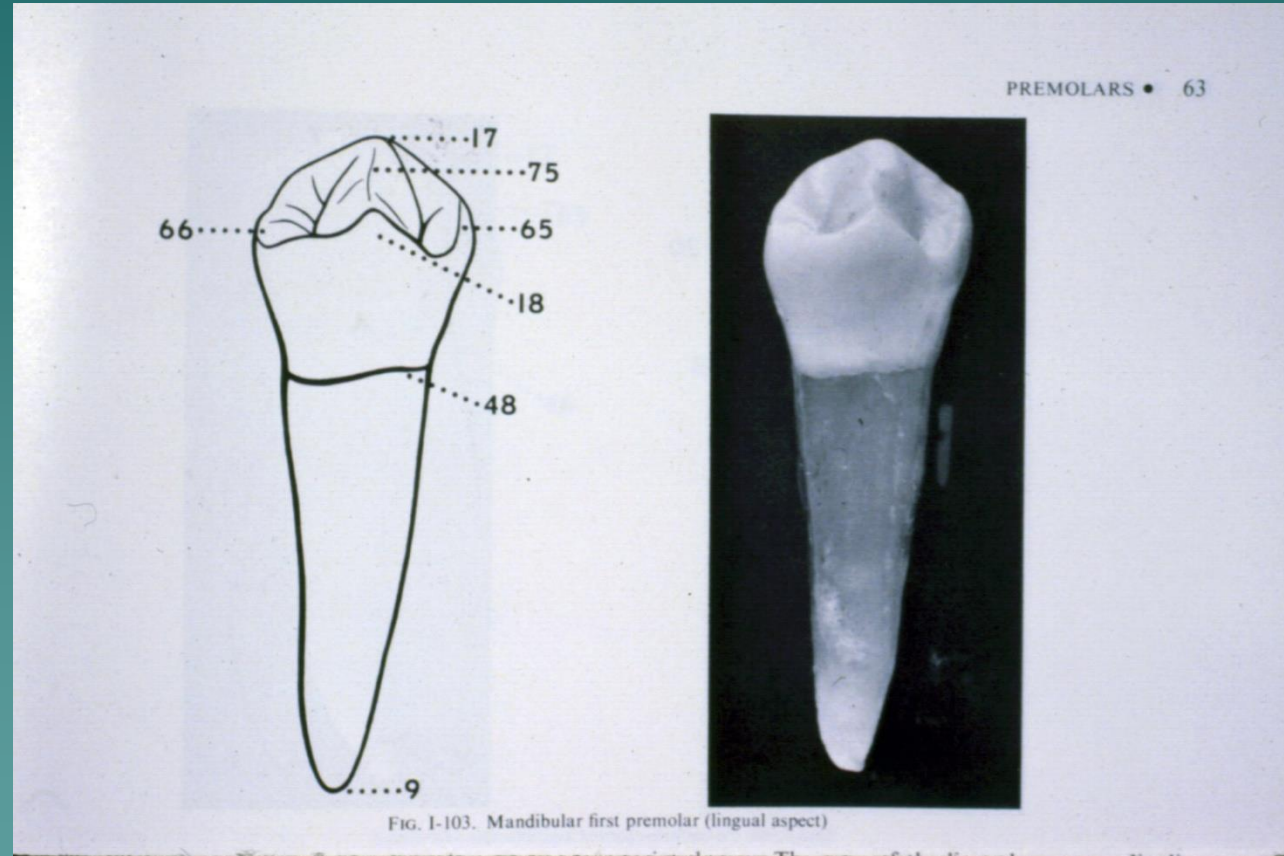


FIG. I-101. Mandibular first premolar (buccal aspect)

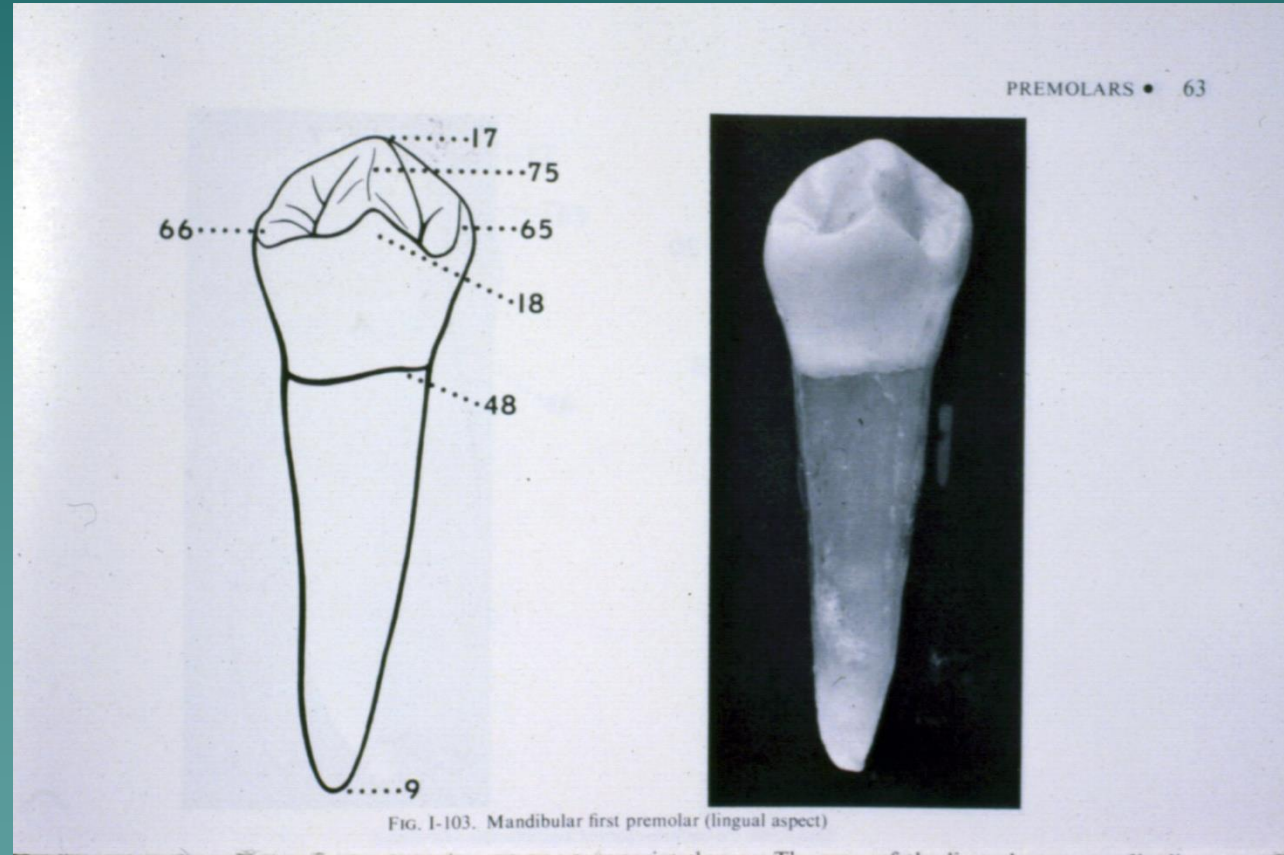
# 1<sup>st</sup> Mn PM Lingual View

- ◆ B cusp large like canine
- ◆ L cusp like large tubercle
- ◆ M cusp ridge shorter than distal



# 1<sup>st</sup> Mn PM Lingual View

- ◆ B portion wider MD than lingual
- ◆ Occlusal surface visible from this side
- ◆ B triangular ridge from B cusp ridge across crown to L cusp





# Mesial View 1<sup>st</sup> Mn PM

- ◆ B cusp
- ◆ L cusp
- ◆ Triangular ridge 70
- ◆ M marginal ridge 65
- ◆ ML groove

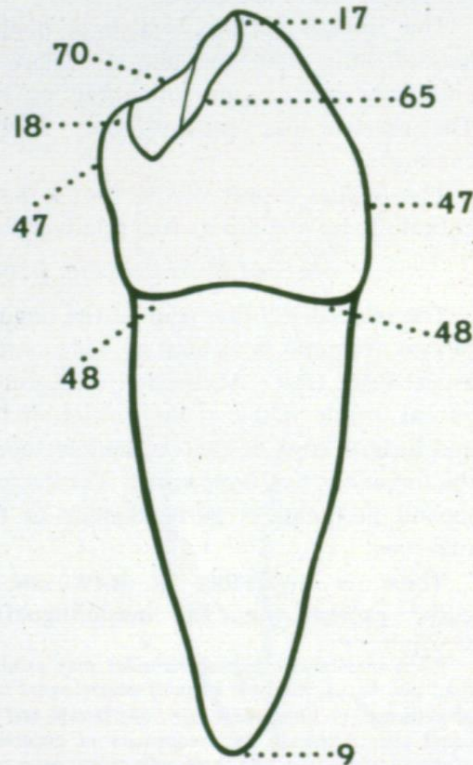


FIG. I-105. Mandibular first premolar (mesial aspect)

# 1<sup>st</sup> Man PM

- ◆ Outline diamond shaped
- ◆ Widest buccal half
- ◆ Buccal ridge prominent
- ◆ Three lobes
- ◆ Apex of B cusp near center of tooth
- ◆ Continuous transverse ridge

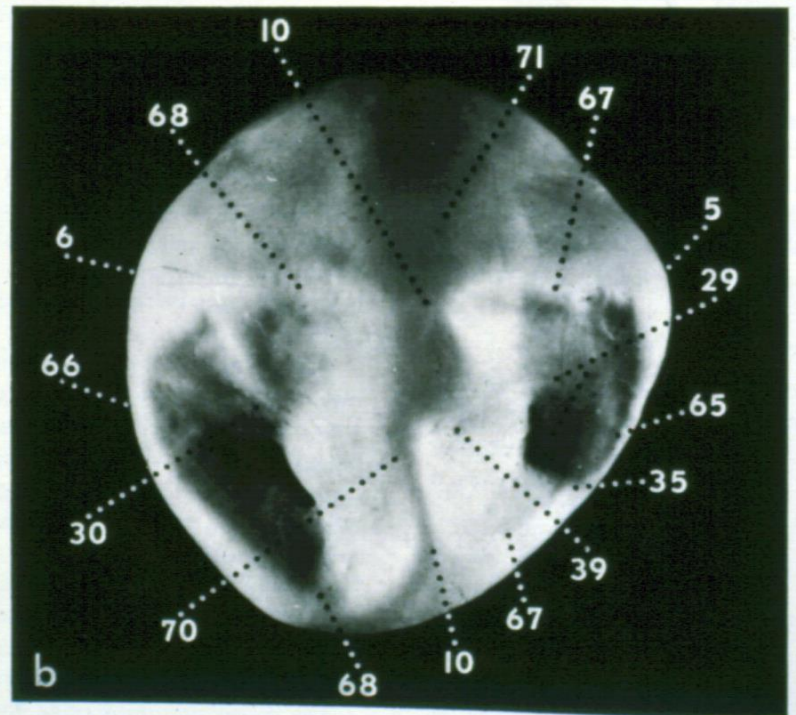
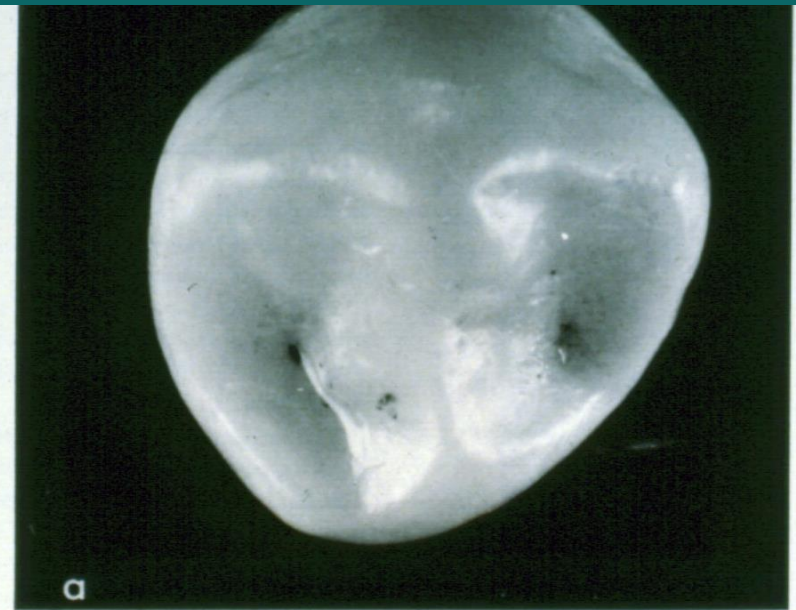


FIG. I-109. Mandibular first premolar (occlusal aspect), *a*, actual crown; *b*, cast

# 1<sup>st</sup> Man PM

- ◆ M marginal ridge shorter
- ◆ M (29) D (30) fossae
- ◆ Each a pit and groove
- ◆ M marginal groove
- ◆ Central groove short 39
- ◆ M marginal ridge cut by ML groove 35

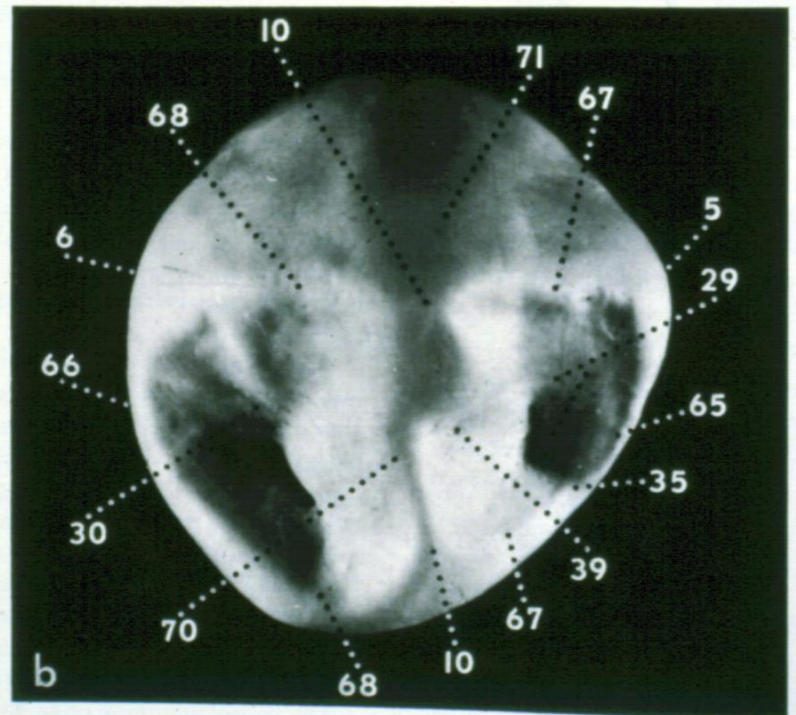
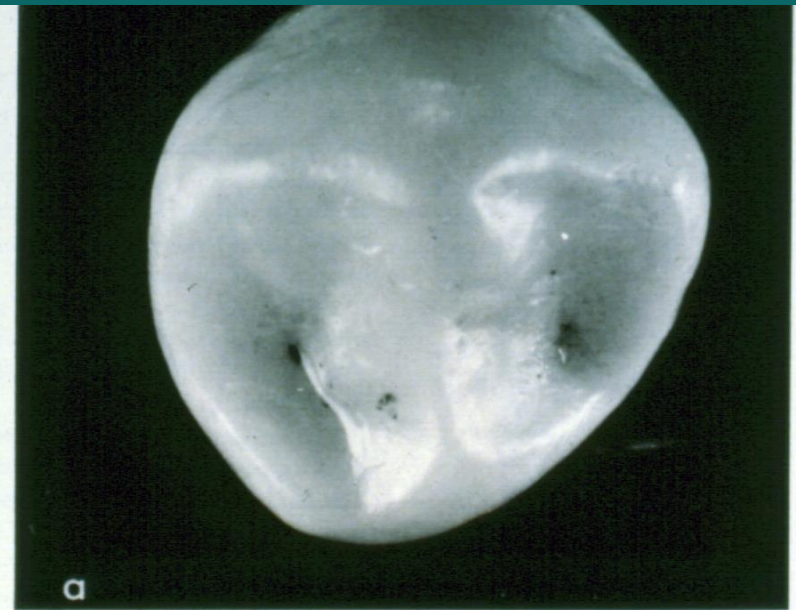


FIG. I-109. Mandibular first premolar (occlusal aspect). *a*, actual crown; *b*, cast

# Variation of 1<sup>st</sup> Man PM

- ◆ Transverse ridge continuous or divided by central groove
- ◆ Lingual cusp absent, tubercle, large, to as many as 4
- ◆ Usually single ML groove, but may have 1 D and 1 L
- ◆ Accessory transverse ridges –up to 5
- ◆ D style on B cusp margin
- ◆ 1 root common, but 2 roots an option

# First Man Premolar Cusp Number

