

**TOOTH IDENTIFICATION**

**OF**

**DOMESTIC ANIMALS**

**Barry Brown\* and Louise Martin\*\***

# **TOOTH IDENTIFICATION**

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# TOOTH IDENTIFICATION

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## **TOOTH IDENTIFICATION**

# TOOTH IDENTIFICATION

## Introduction

This manual is for archaeologists working in Europe wanting to identify teeth. It omits detailed anatomy.

The animal species described have an upper jaw consisting of a paired maxilla and premaxilla, which are joined together by sutures, and a lower jaw, a paired bone, which may or may not be joined by a suture.

There are two generations of teeth: a deciduous dentition made up of incisors, canines and molars, which are replaced by a permanent dentition of incisors, canines, premolars, which last replace the deciduous molars. The first premolar has sometimes in the course of evolution been suppressed. Behind these are the molars.

The teeth in the premaxilla are incisors. The most anterior teeth in the maxilla are the canines and behind them for the deciduous dentition are the molars and in the permanent dentition, the premolars. The lower jaw has a similar series of teeth.

Teeth have a single crown with one or more cusps and have one, two or three roots depending on their location in the jaw. They are composed of dentine, enamel and cementum. They have a central core of dentine, which in the crown is covered by a hardwearing outer cover of enamel enamel, and depending on species may have a thin covering of cementum. The root dentine is covered by cementum, and it is with this layer the teeth are secured to the bone socket by the periodontal ligament.

The several surfaces of the teeth have their own names, which are identified by their location in the jaws.

a). For the incisors (I), canines (C), premolars (P) and molars (M):

LINGUAL facing the tongue.	L
BUCCAL facing the cheeks.	B
MESIAL the anterior face.	M
DISTAL the posterior face.	D
OCCLUSAL opposing biting surfaces.	O

b). For the central and lateral incisors (I):

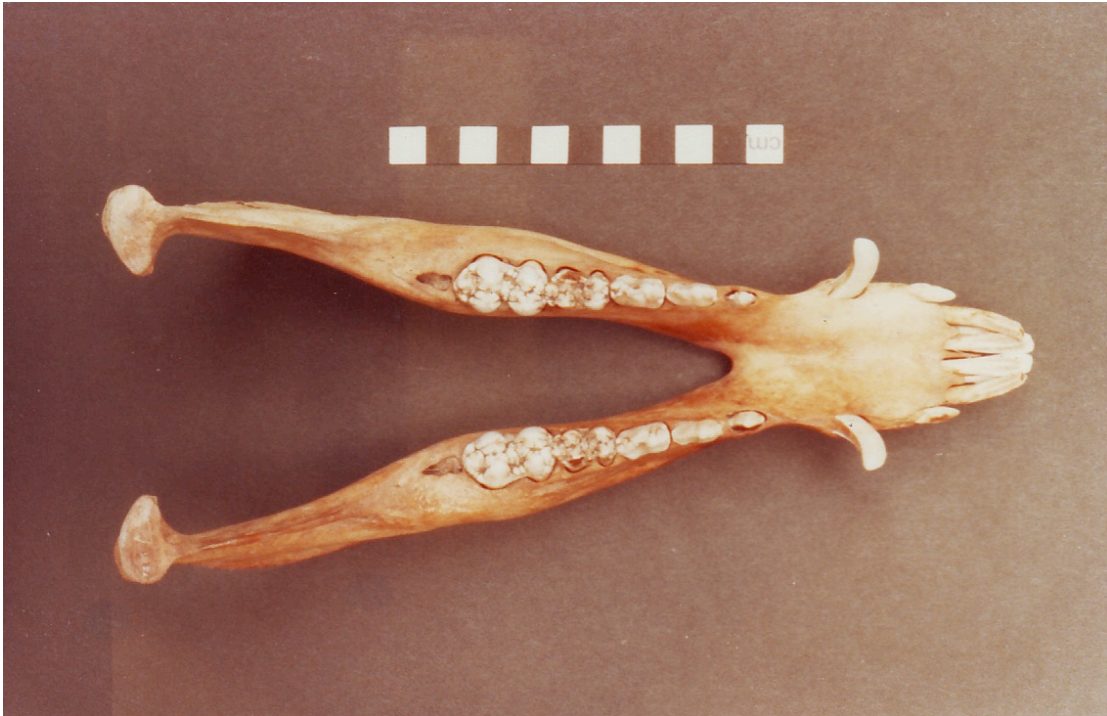
LINGUAL facing the tongue.	L
LABIAL facing the lips.	La
MESIAL nearest to midline.	M
DISTAL furthest away from midline.	D
INCISAL biting edge.	I

## TOOTH IDENTIFICATION

### PIG (Sus)



**a) Maxilla**



**b) Mandible**

I 3/3, C 1/1, P 4/4, M 3/3 x2

**Fig 1.** Occlusal view of teeth of a) maxilla and b) mandible.

## TOOTH IDENTIFICATION

### PIG (Sus)

**DISTAL**

**MESIAL**



**Lingual**



**Occlusal**



**Buccal**

^  
M3

^  
M2

^  
M1

^  
P4

^  
P3

^  
P2

**Premolars:** Occlusal view, crowns rectangular, length twice width, 2:1. Note: First premolar has been suppressed in course of evolution.

**Molars:** Larger than premolars, length twice width, 2:1, small cusps on corners.

### **MAXILLA ROOT NUMBERS**

<b>Premolars</b>	<b>mesial</b>	<b>distal</b>	<b>middle</b>
No. 2	1	1	
No. 3	1	2	
No. 4	2	2	
<b>Molars</b>			
No. 1	2	2	
No. 2	2	2	
No. 3	2	1	2

**Fig. 2.** Lingual, occlusal and buccal view of premolars and molars of maxilla.



## TOOTH IDENTIFICATION

### PIG (Sus)



**Lingual**



**Occlusal**



**Buccal**

^  
**M2**

^  
**M1**

^  
**P4**

^  
**P3**

**Premolars:** Crowns rectangular, length twice width, 2:1

**Molars:** Larger than premolars, length three times width, 3:1

### **MANDIBLE ROOT NUMBERS**

<b>Premolars</b>	<b>mesial</b>	<b><u>distal</u></b>	<b><u>middle</u></b>
No. 2	1	1	
No. 3	1	1	
No. 4	1	1	
<b>Molars</b>			
No. 1	2	2	
No. 2	2	2	
No. 3	2	1	2

**Fig. 3.** Lingual, occlusal and buccal view of premolars and molars of mandible.

## TOOTH IDENTIFICATION

### PIG (Sus).



**a) Occlusal**



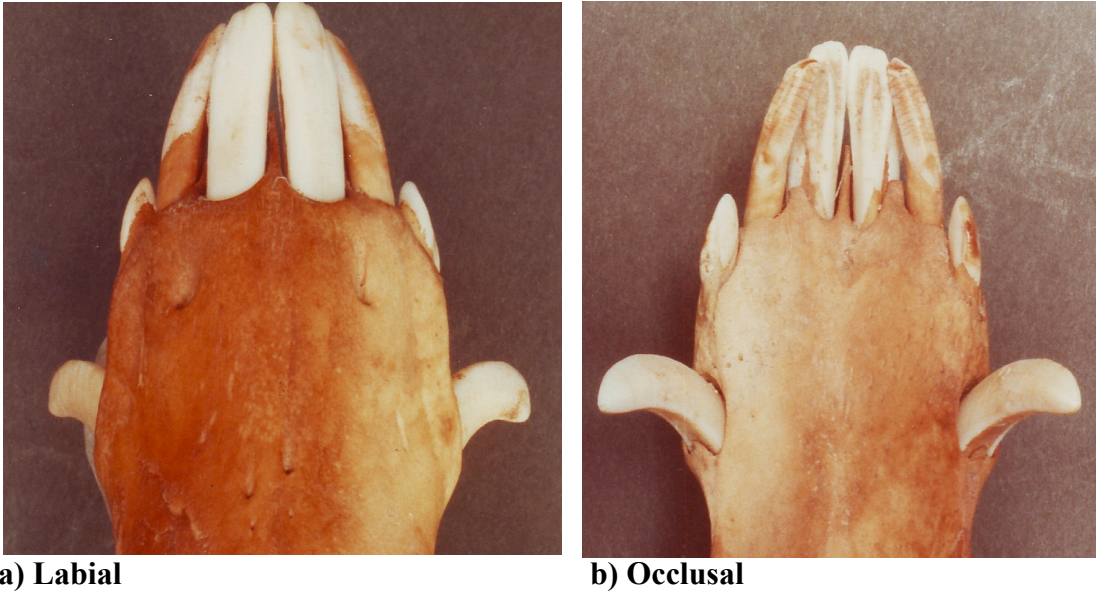
**b) Lateral**

**Occlusal a) and b) lateral:** Central incisor has large triangular crown with straight mesial surface, concave distal surface and grooved lingual surface. It has a large irregular incisal edge. The second incisor small cap of enamel. And the third incisor mesial to distal length is  $4 \times$  lateral to lingual width with large central cusp.

**Fig. 4.** Occlusal and lateral views of incisors on of premaxilla and occlusal and lateral views of canines of maxilla.

## TOOTH IDENTIFICATION

### PIG (sus)



**Labial a) and occlusal b):** First and second incisors are long flattened planks and the third is cone shaped. The canines are large curved convex mesially, concave distally and flattened laterally.

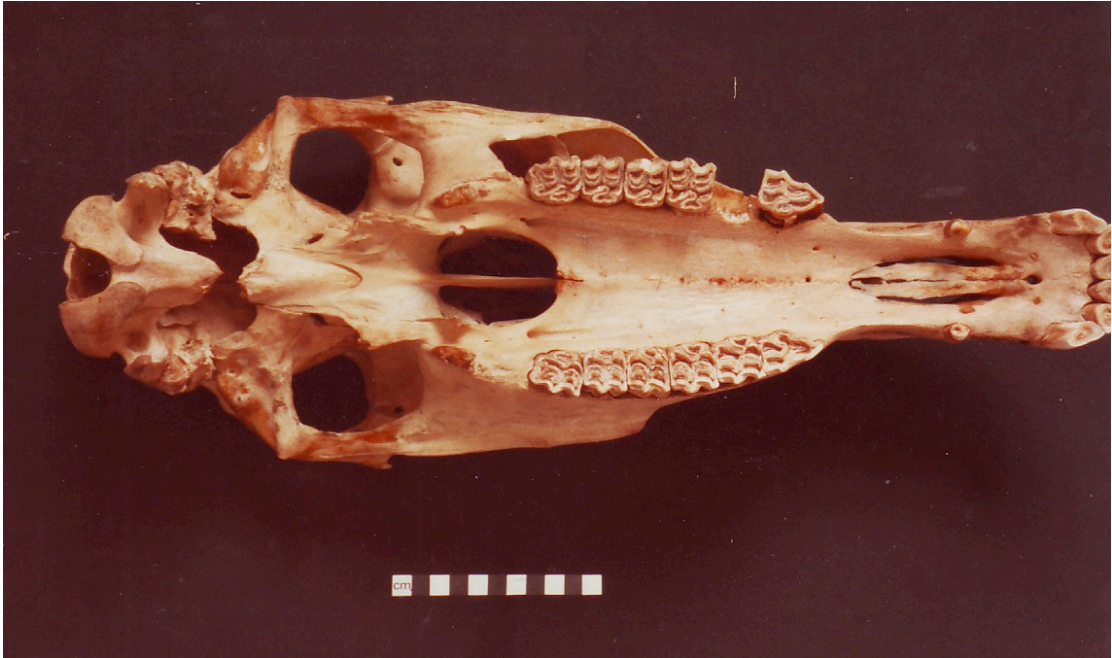
**Fig. 5.** Occlusal and lateral views of incisors and canines of mandible.



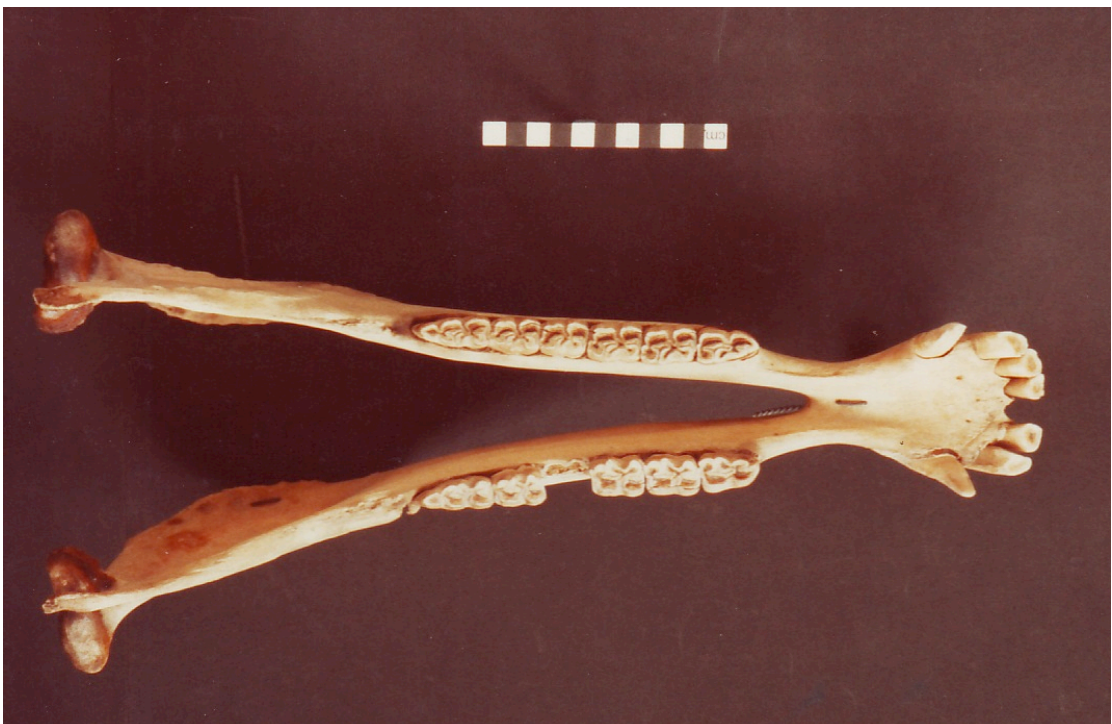
## **TOOTH IDENTIFICATION**

## TOOTH IDENTIFICATION

### HORSE (Equus)



**a) Maxilla**



**b) Mandible**

I 3/3, C 0-1/0-1, P 3-4/3. M 3/3 x2

**Fig 6.** Occlusal view of teeth of a) maxilla and b) mandible.

## TOOTH IDENTIFICATION

### HORSE (Equus)

**DISTAL**

**MESIAL**



**Lingual**



**Occlusal**



**Buccal**

**M3**

**M2**

**M1**

**P4**

**P3**

**P2**

**Premolars:** First lost, the rest have two cusps, lingual surface smooth, buccal surfaces have two vertical ridges. Occlusally in outline, the second triangular, third and fourth square.

**Molars:** Have two cusps, lingual surface smooth. Buccal surfaces have two vertical ridges. Occlusally in outline all are square.

### **MAXILLA ROOT NUMBERS**

<b>Premolars</b>	<b>mesial</b>	<b>distal</b>	<b>lingual</b>
No. 2	1	1	1
No. 3	1	1	1
No. 4	1	1	1
<b>Molars</b>			
No. 1	1	1	1
No. 2	1	1	1
No. 3	1	1	1

**Fig. 7.** Lingual, occlusal and buccal view of premolars and molars of maxilla.



## TOOTH IDENTIFICATION

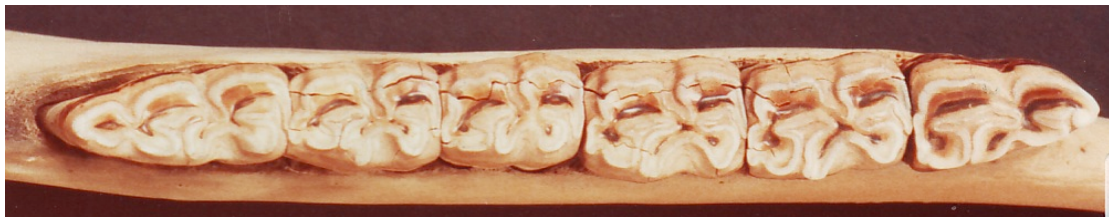
### HORSE (Equus)

**DISTAL**

**MESIAL**



**Lingual**



**Occlusal**



**Buccal**

^  
**M3**

^  
**M2**

^  
**M1**

^  
**P4**

^  
**P3**

^  
**P2**

**Premolars:** First lost, the rest have two cusps with two vertical buccal ridges. Occlusally in outline, second triangular, third and fourth square.

**Molars:** Have two cusps, lingual surface smooth. Buccal surfaces have two vertical ridges.

#### MANDIBLE ROOT NUMBERS

<b>Premolars</b>	<b>mesial</b>	<b><u>distal</u></b>
No. 2	1	1
No. 3	1	1
No. 4	1	1
<b>Molars</b>		
No. 1	1	1
No. 2	1	1
No. 3	1	2 fused distal

**Fig. 8.** Lingual, occlusal and buccal view of premolars and molars of mandible.

## TOOTH IDENTIFICATION

### HORSE (Equus)



**Maxilla occlusal**



**Mandible labial**



**Maxilla lateral**



**Mandible lateral**



**Mandible labial**

**Incisors**: Have square to triangular biting surfaces with a narrow groove on their labial surfaces

**Canines**: Maxillary canines are small with a slight convex mesial curve. Mandibular canines are three times larger with marked convex mesial and concave distal curves.

**Fig. 9.** Occlusal and lateral views of incisors and canines of mandible.



## TOOTH IDENTIFICATION

### RED DEER (*Cervus elaphus*)



a) Maxilla



b) Mandible

I 0/3, C 0/1, P 3/3, M 3/3 x2

**Fig 10.** Occlusal view of teeth of a) maxilla and b) mandible. Numbers are for one side

## TOOTH IDENTIFICATION

### RED DEER (*Cervus elaphus*)

DISTAL

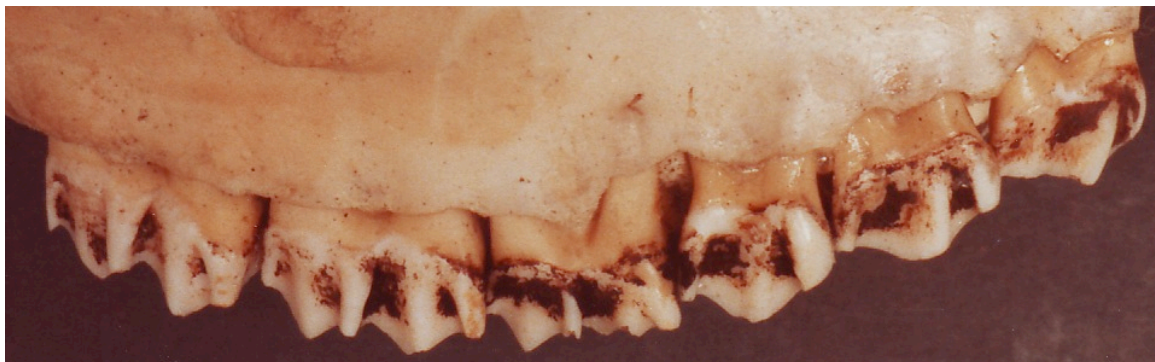
MESIAL



Lingual



Occlusal



Buccal

M3

M2

M1

P4

P3

P2

**Premolars:** Occlusal view, crowns triangular, length half width, 1:2 Note: First premolar has been suppressed in course of evolution.

**Molars:** Larger than premolars, occlusally nearly square, smooth lingual surface. vertical ridges buccally.

**Fig. 11.** Lingual, occlusal and buccal view of premolars and molars of maxilla.



## TOOTH IDENTIFICATION

### RED DEER (*Cervus elaphus*)

DISTAL

MESIAL



Lingual



Occlusal



Buccal

M3

M2

M1

P4

P3

P2

**Premolars:** Crowns increasing in size from 2<sup>nd</sup> to 3<sup>rd</sup>, smooth lingual surface, vertical ridgeß buccal surface

**Molars:** Larger than premolars with four cusps 1<sup>st</sup> and 2<sup>nd</sup> and 5 cusps on 3rd

**Fig. 12.** Lingual, occlusal and buccal view of premolars and molars of mandible.



## **TOOTH IDENTIFICATION**

## TOOTH IDENTIFICATION

### ROE DEER (*Capreolus capreolus*).



**a) Maxilla**



**b) Mandible**

I 0/3, P 3/3, M 3/3 x2

**Fig. 13.** Occlusal view teeth of a) maxilla and b) mandible. Numbers are for one of side.

## TOOTH IDENTIFICATION

### ROE DEER (*Capreolus capreolus*)

DISTAL

MESIAL



Lingual



Occlusal



Buccal

^ ^ ^ ^ ^ ^  
M3 M2 M1 P4 P3 P2

**Premolars:** Occlusal view, crowns triangular, length half width, 1:2 Note: First premolar has been suppressed in course of evolution.

**Molars:** Larger than premolars, occlusally nearly square, smooth lingual surface, vertical ridges buccally.

**Fig. 14.** Lingual, occlusal and buccal view of premolars and molars of maxilla.



## TOOTH IDENTIFICATION

### ROE DEER (*Capreolus capreolus*)

DISTAL

MESIAL



Lingual



Occlusal



Buccal

^  
M3

^  
M2

^  
M1

^  
P4

^  
P3

^  
P2

**Premolars:** Crowns increasing in size from 2<sup>nd</sup> to 3<sup>rd</sup>, smooth lingual surface, occlusally irregular triangular outlines.

**Molars:** Larger than premolars with four cusps 1<sup>st</sup> and 2<sup>nd</sup> and 5 cusps on 3<sup>rd</sup>.

**Fig. 15.** Lingual, occlusal and buccal view of premolars and molars of mandible.

## TOOTH IDENTIFICATION

### ROE DEER (*Capreolus capreolus*)



**a) Lingual**

**b) Labial view**

**Fig. 16.** a) Lingual. The 3 paired incisors are shovel shape decreasing in size from the first to the canines. b) Labial. The incisors and canine are slightly convex

## TOOTH IDENTIFICATION

### SHEEP (Ovis)



**a) Maxilla**



**b) Mandible**

I 0/3, C 0/1, P3/3, M3/3 x2

**Fig 17.** Occlusal view teeth of a) maxilla and b) mandible. Numbers are for one of side.

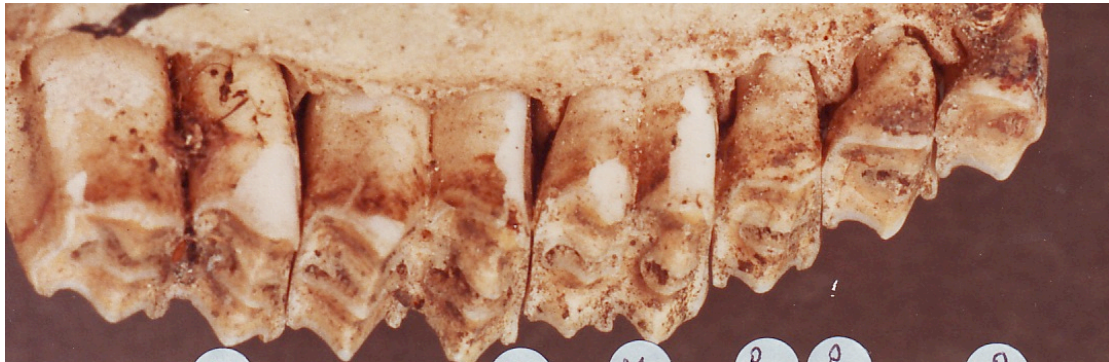


## TOOTH IDENTIFICATION

### SHEEP (Ovis)

DISTAL

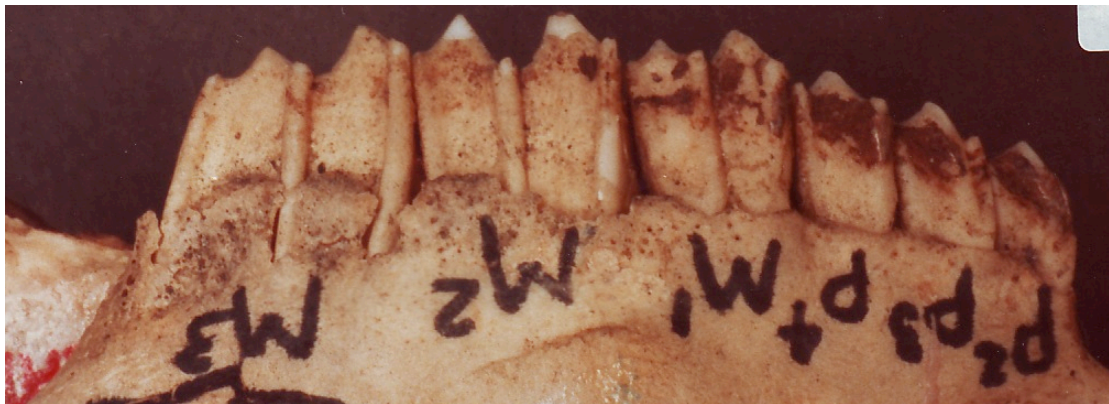
MESIAL



Lingual



Occlusal



Buccal

M3

M2

M1

P4

P3

P2

**Premolars:** Occlusal view, crowns square. Increase in size from 2<sup>nd</sup> to 4<sup>th</sup>. Note: First premolar has been suppressed in course of evolution.

**Molars:** Larger than premolars, occlusally rectangular, smooth lingual surface. vertical ridges buccally.

**Fig. 18.** Lingual, occlusal and buccal view of premolars and molars of maxilla.

## TOOTH IDENTIFICATION

### SHEEP (Ovis)

DISTAL

MESIAL



Lingual



occlusal



Buccal

M3

M2

M1

P4

P3

P2

**Premolars:** Occlusal view, crowns variable longer mesial/distal lengths than width, smooth lingual and buccal surfaces. Note: First premolar has been suppressed in course of evolution.

**Molars:** Larger than premolars, occlusally rectangular, smooth lingual surface. 1<sup>st</sup> and 2<sup>nd</sup> have 4 cusps, 3<sup>rd</sup> has 5 cusps. Slight vertical ridges buccally.

**Fig. 19.** Lingual, occlusal and buccal view of premolars and molars of mandible.



## **TOOTH IDENTIFICATION**

## TOOTH IDENTIFICATION

### SOAY SHEEP (Ovis)



**a). Maxilla**



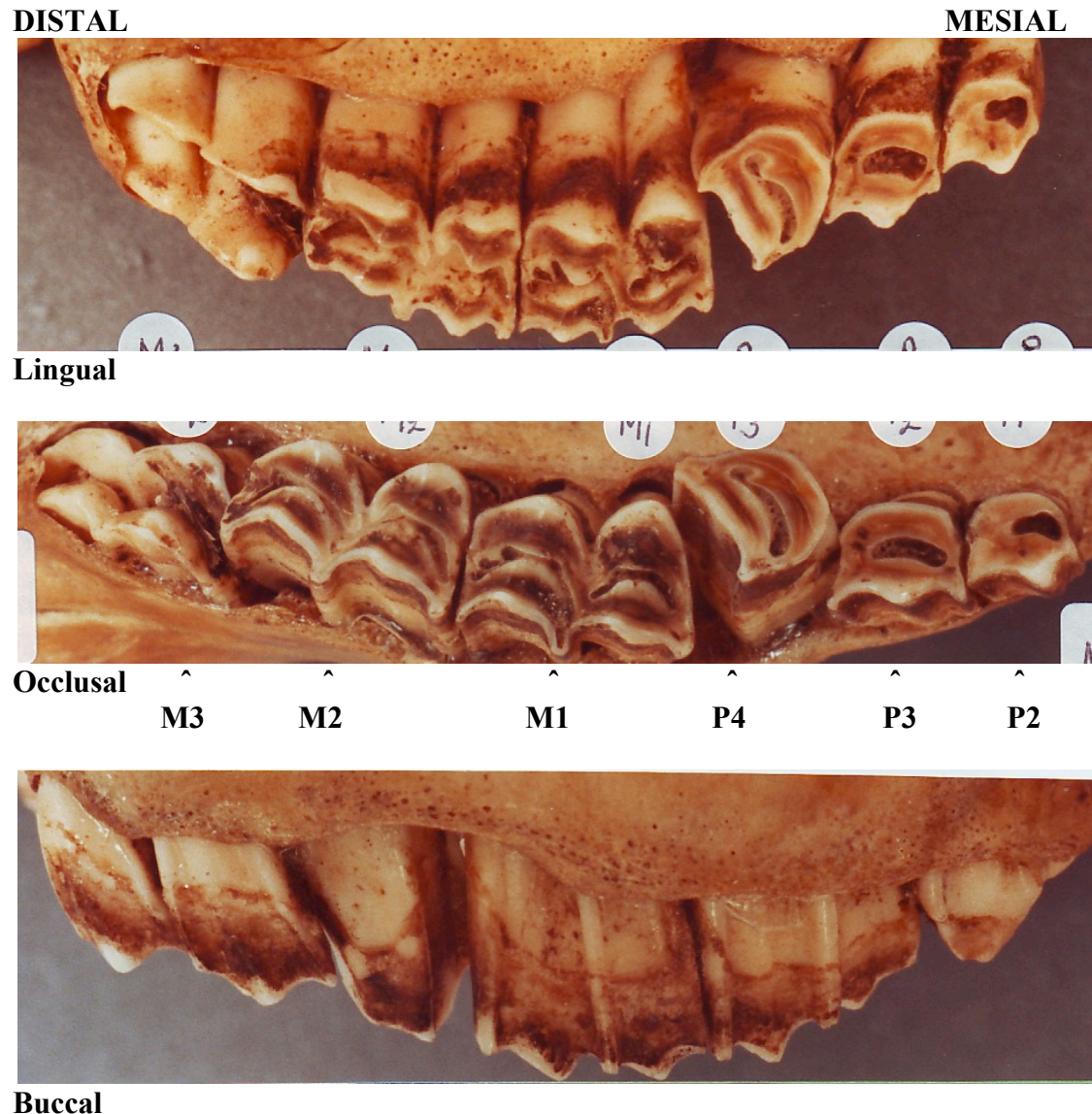
**b). Mandible**

I 0/3, C 0/1, P 3/3, M 3/3 x2

**Fig 20.** Occlusal view teeth of a) maxilla and b) mandible. Numbers are for one of side.

## TOOTH IDENTIFICATION

### SOAY SHEEP (Ovis)



**Premolars:** Occlusal view, crowns square. The 4<sup>th</sup> premolar is rotated. Note: First premolar has been suppressed in course of evolution.

**Molars:** Larger than premolars, occlusally rectangular, smooth lingual surface. vertical ridges buccally.

**Fig. 21.** Lingual, occlusal and buccal view of premolars and molars of maxilla.

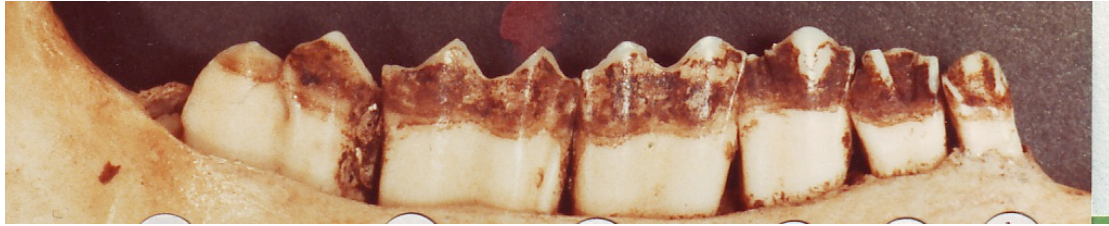


## TOOTH IDENTIFICATION

### SOAY SHEEP (Ovis)

DISTAL

MESIAL



Lingual



Occlusal



Buccal

^  
M3

^  
M2

^  
M1

^  
P4

^  
P3

^  
P2

**Premolars:** Crowns increasing in size from 2<sup>nd</sup> to 3<sup>rd</sup>, smooth lingual surface, all have vertical ridges located mesially and distally on buccal surface.

**Molars:** Larger than premolars with four cusps 1<sup>st</sup> and 2<sup>nd</sup> and 5 cusps on 3<sup>rd</sup>. Cusps are columnar.

**Fig. 22.** Lingual, occlusal and buccal view of premolars and molars of mandible.

## **TOOTH IDENTIFICATION**

## TOOTH IDENTIFICATION

### GOAT (Capra)



**a). Maxilla**



**b) Mandible**

I 0/3, C 0/1, P 3/3, M 3/3 x2

**Fig. 23.** Occlusal view teeth of a) maxilla and b) mandible. Numbers are for one of side.



## TOOTH IDENTIFICATION

### GOAT (Capra)

DISTAL

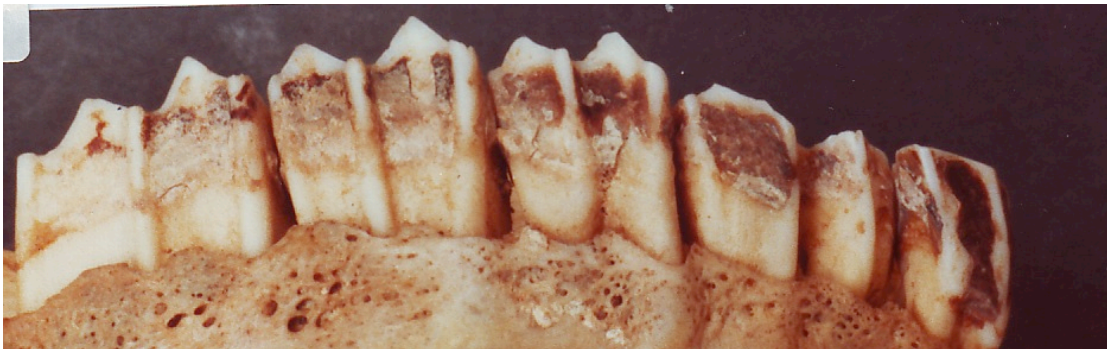
MESIAL



Lingual



Occlusal



Buccal

M3

M2

M1

P4

P3

P2

**Premolars:** Occlusal view, crowns rectangular. The 2nd premolar is rotated. Note: First premolar has been suppressed in course of evolution.

**Molars:** Larger than premolars, occlusally rectangular, smooth lingual surface and buccally mesially and distally vertical ridges

**Fig. 24.** Lingual, occlusal and buccal view of premolars and molars of maxilla.

## TOOTH IDENTIFICATION

### GOAT (Capra)

DISTAL

MESIAL



Lingual



Occlusal



Buccal

^  
M3                      M2                      M1                      P4                      P3                      P2

**Premolars:** Crowns increasing in size from 2<sup>nd</sup> to 4<sup>th</sup>, smooth lingual surface. Buccal vertical ridges appear to have been worn away.

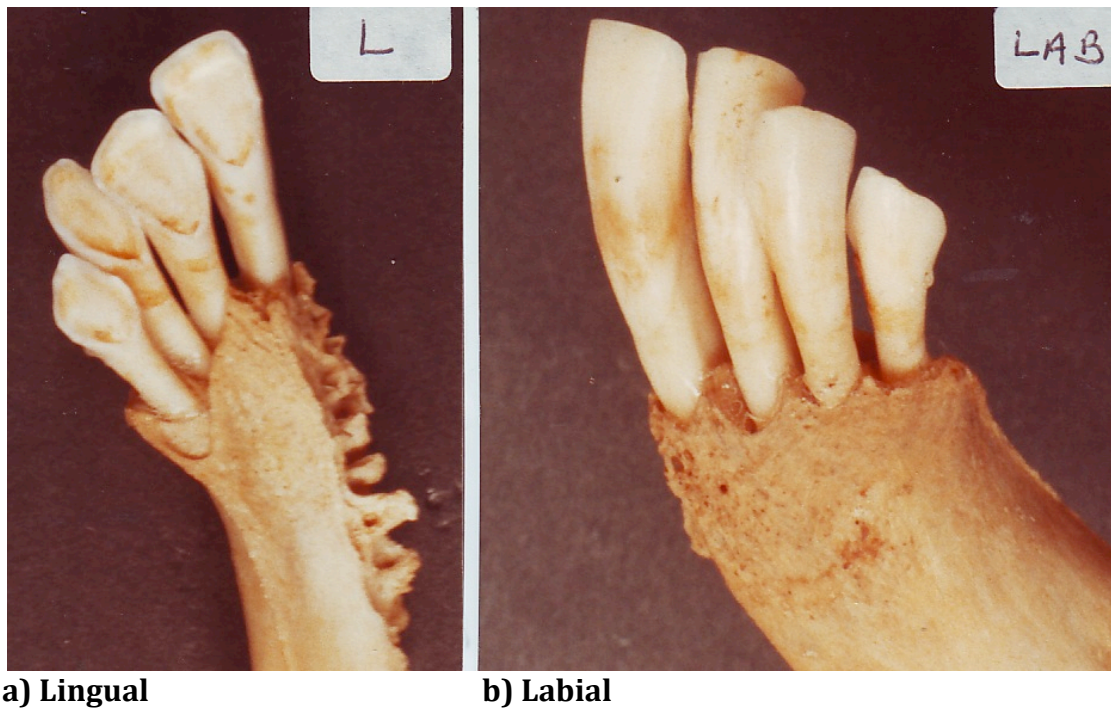
**Molars:** Larger than premolars with four cusps 1<sup>st</sup> and 2<sup>nd</sup> and 3<sup>rd</sup>. Cusps are columnar.

**Fig. 25.** Lingual, occlusal and buccal view of premolars and molars of mandible.



## TOOTH IDENTIFICATION

### GOAT (Capra)



**Fig. 26.** a) Lingual. The 3 paired incisors are shovel shape decreasing in size from the first to the canines. b) Labially the incisors and canine are slightly convex

## TOOTH IDENTIFICATION

### DOG (Canis)



**a) Maxilla**



**b) Mandible**

I 3/3, C 1/1, P 4/4, M 2/3 x2

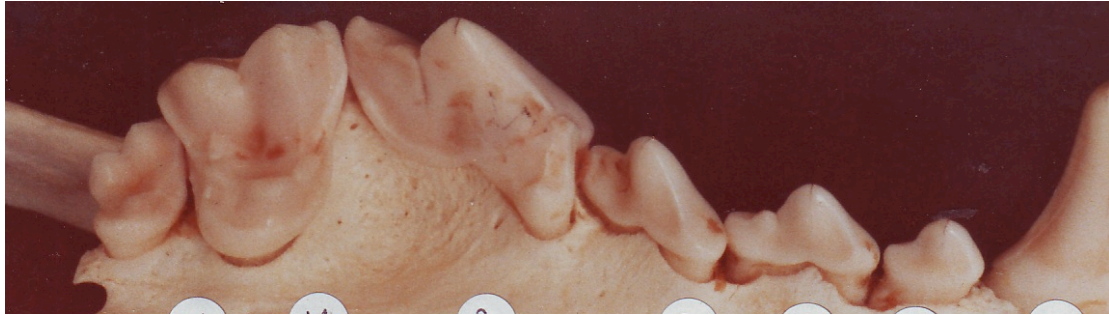
**Fig 27.** Occlusal view of teeth (numbers for one side) of a) maxilla and b) mandible.

## TOOTH IDENTIFICATION

### DOG (Canis)

DISTAL

MESIAL



Lingual



Occlusal



M2

M1

P4

P3

P2

P1

Buccal

**Premolars:** They have a large triangular mesial cusp and small distal cusp, but the 4<sup>th</sup> premolar is four times larger. Occlusally they are ovoid in shape with rounded mesial and distal contact surfaces.

**Molars:** They have three cusps and occlusally are square. The 1<sup>st</sup> molar is three times larger than the 2<sup>nd</sup>.

**Fig. 28.** Lingual, occlusal and buccal view of premolars and molars of maxilla.



## TOOTH IDENTIFICATION

### DOG (Canis)



**Lingual**



**Occlusal**



**Buccal**

^     ^                     ^                     ^                     ^     ^  
M3   M2                     M1                     P4                     P3     P2     P1

**Premolars:** Laterally the 1<sup>st</sup> has a single triangular cusp, the 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> have three cusps. Occlusally they are oval shaped with rounded contact surfaces.

**Molars:** The 1<sup>st</sup> has a large central triangular cusp with a smaller mesial and distal cusp.

**Fig. 29.** Lingual, occlusal and buccal view of premolars and molars of mandible

## TOOTH IDENTIFICATION

### DOG (Canis)



**a) Maxilla labial**



**b) Maxilla occlusal**



**c) Mandible lingual**



**d) Mandible labial**



**e) Mandible buccal**

**Fig. 30.** Labial, buccal and occlusal views of incisors and canines of mandible.

## TOOTH IDENTIFICATION

### CAT (*Felis*)



a) Maxilla



b) Mandible

I 3/3, C 1/1, P 3/2, M 1/1 x2

**Fig 31.** Occlusal view teeth of a) maxilla and b) mandible. Numbers are for one of side.



## TOOTH IDENTIFICATION

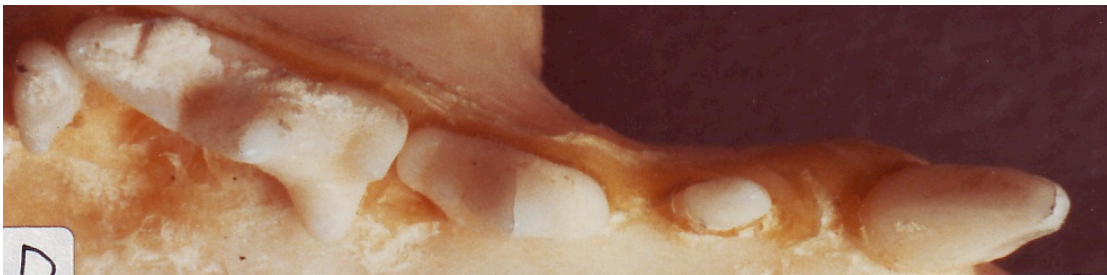
### CAT (Felis)

DISTAL

MAXILLA



Lingual



Occlusal



M1

P4

P3

P2

Buccal

**Premolars:** They have a large triangular mesial cusp and small distal cusp, but the 4<sup>th</sup> premolar is four times larger. Occlusally they are ovoid in shape with rounded mesial and distal contact surfaces. Buccal and lingual surfaces are smooth.

**Molars:** The single molar is vestigial with a single cusp.

**Fig. 32.** Lingual, occlusal and buccal view of premolars and molars of maxilla.

## TOOTH IDENTIFICATION

### CAT (Felis)



**Lingual**



**Occlusal**



**Buccal**

M1

P4

P3

**Premolars:** Laterally the 3<sup>rd</sup> and 4<sup>th</sup> have a large central triangular cusp, with small mesial and distal cusps. Occlusally they are oval shaped with rounded contact surfaces.

**Molars:** There is one molar with large mesial and distal cusps.

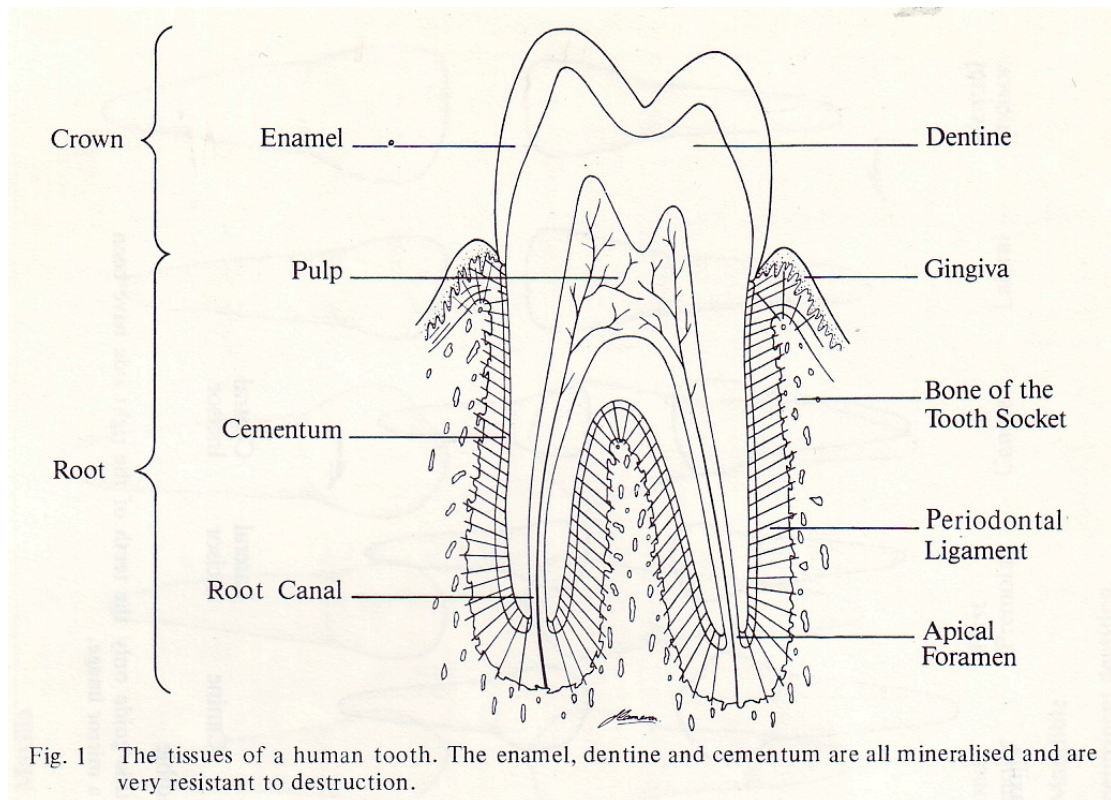
**Fig. 33.** Lingual, occlusal and buccal view of premolars and molars of mandible

## **TOOTH IDENTIFICATION**



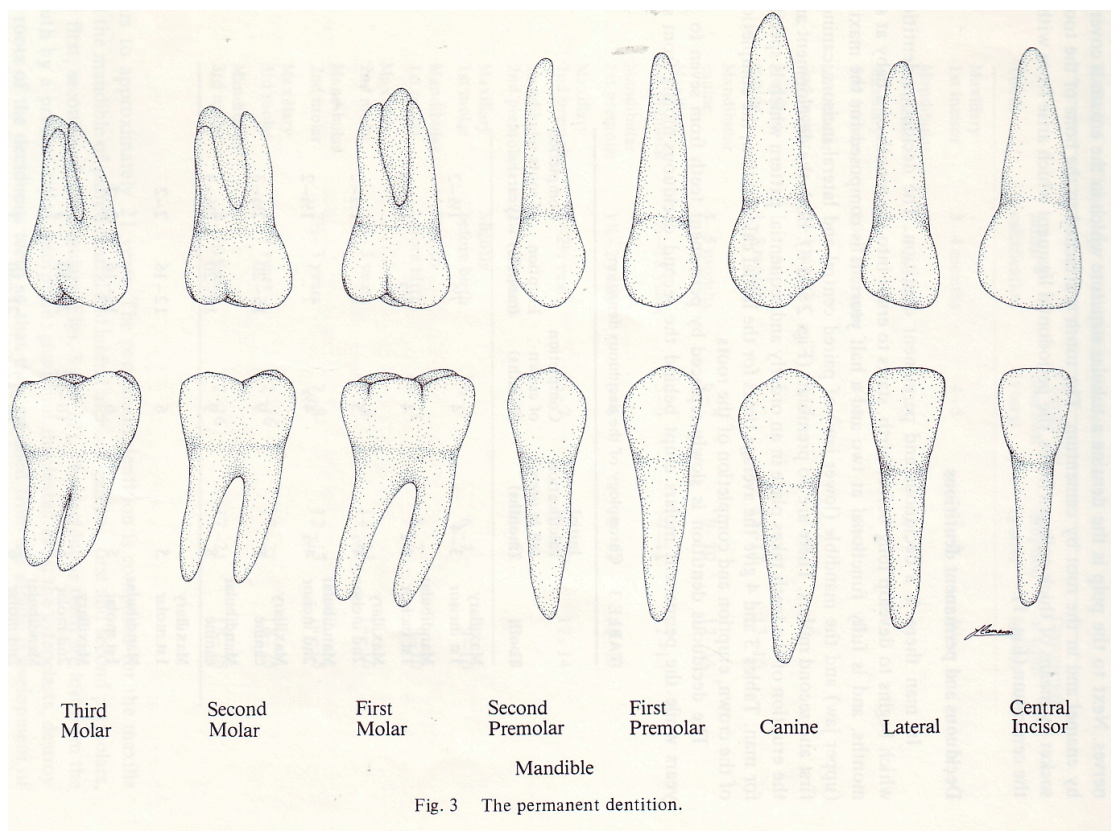
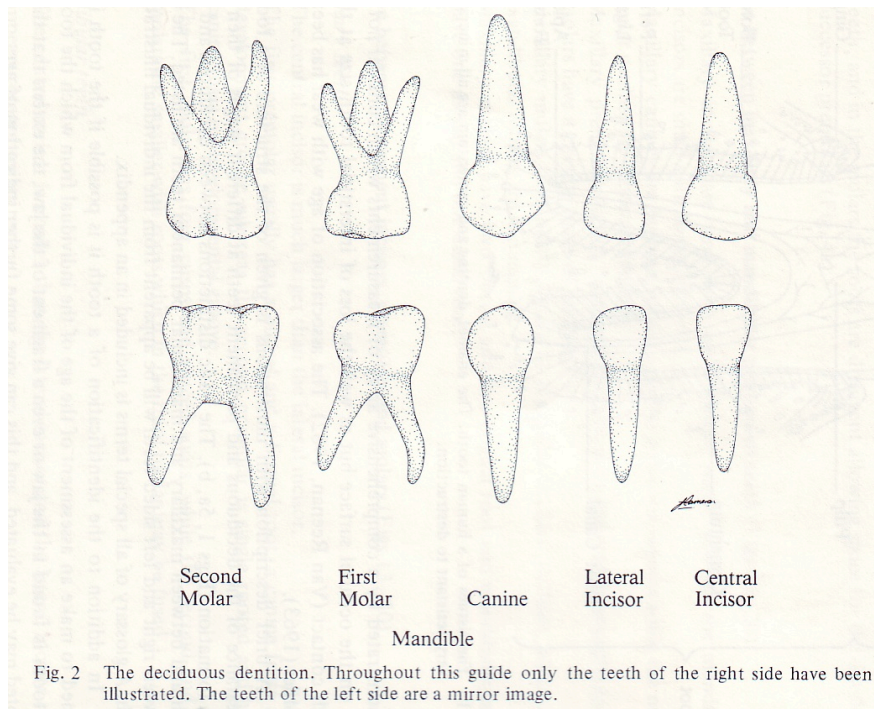
# TOOTH IDENTIFICATION

## MAN (Homo)



# TOOTH IDENTIFICATION

## MAN (Homo)





## TOOTH IDENTIFICATION

### MAN (Homo)

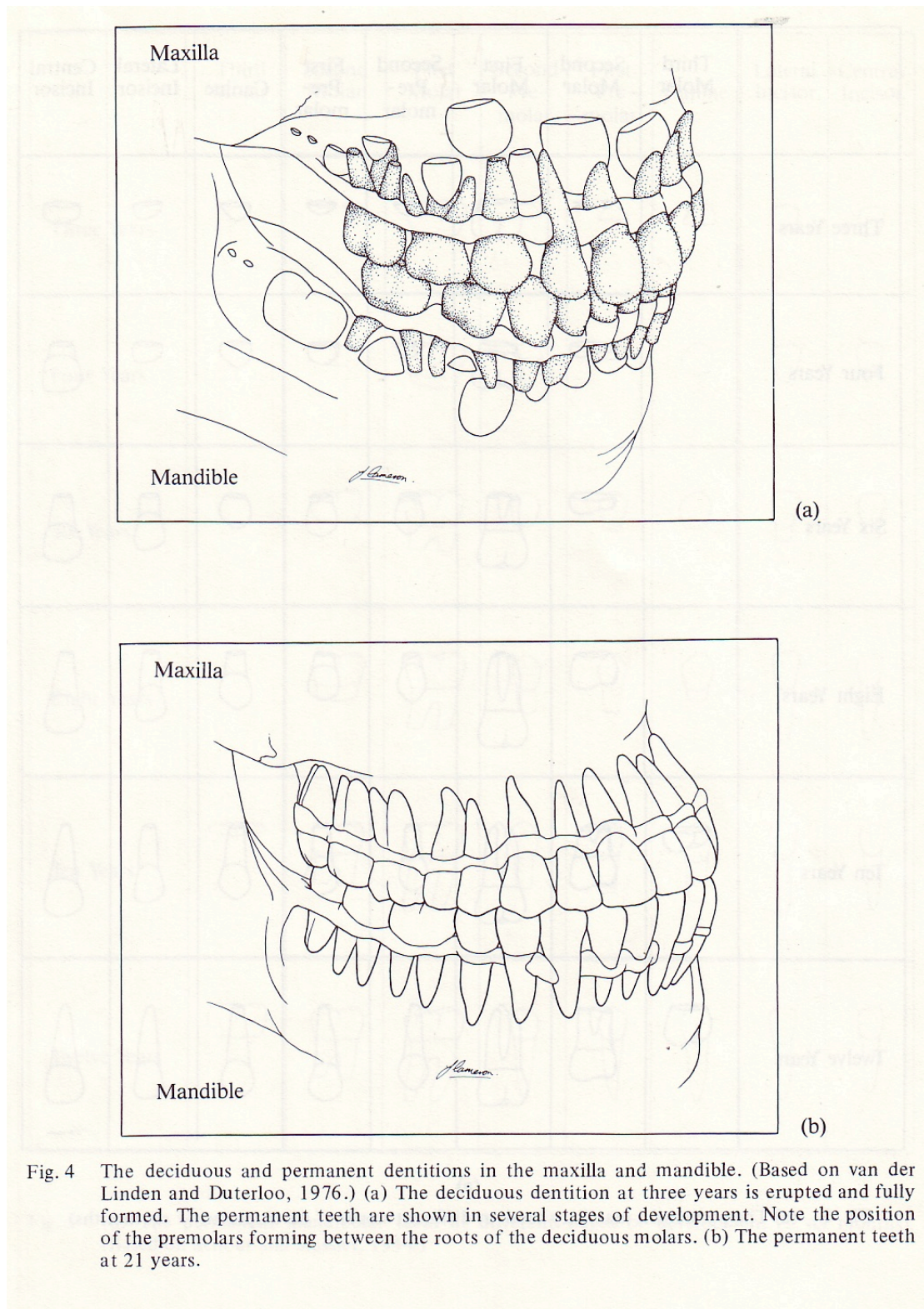
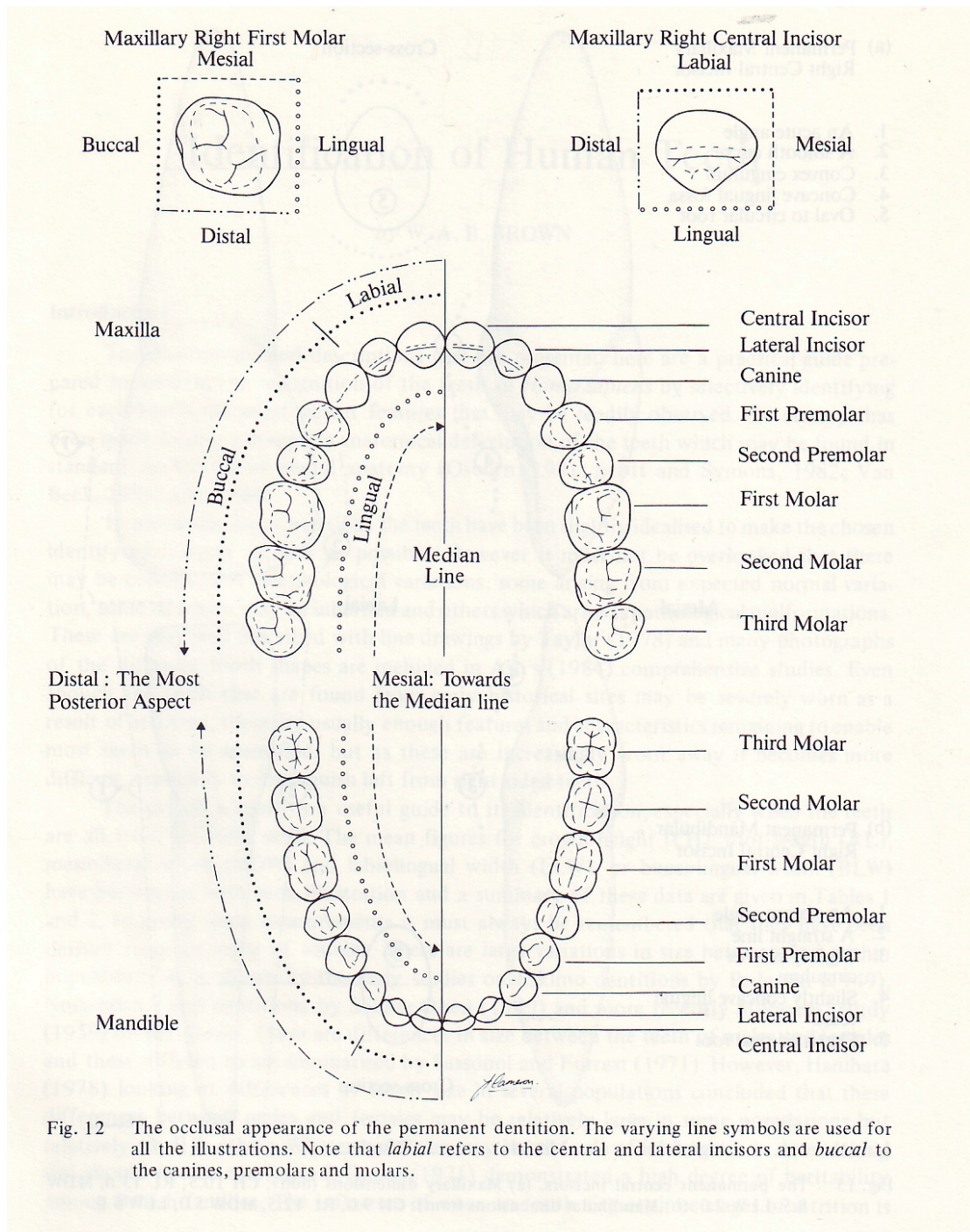


Fig. 4 The deciduous and permanent dentitions in the maxilla and mandible. (Based on van der Linden and Duterloo, 1976.) (a) The deciduous dentition at three years is erupted and fully formed. The permanent teeth are shown in several stages of development. Note the position of the premolars forming between the roots of the deciduous molars. (b) The permanent teeth at 21 years.



## TOOTH IDENTIFICATION



## **TOOTH IDENTIFICATION**

### **Bibliography**

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