

# Bony framework of the skull. Sphenoid and temporal bones.

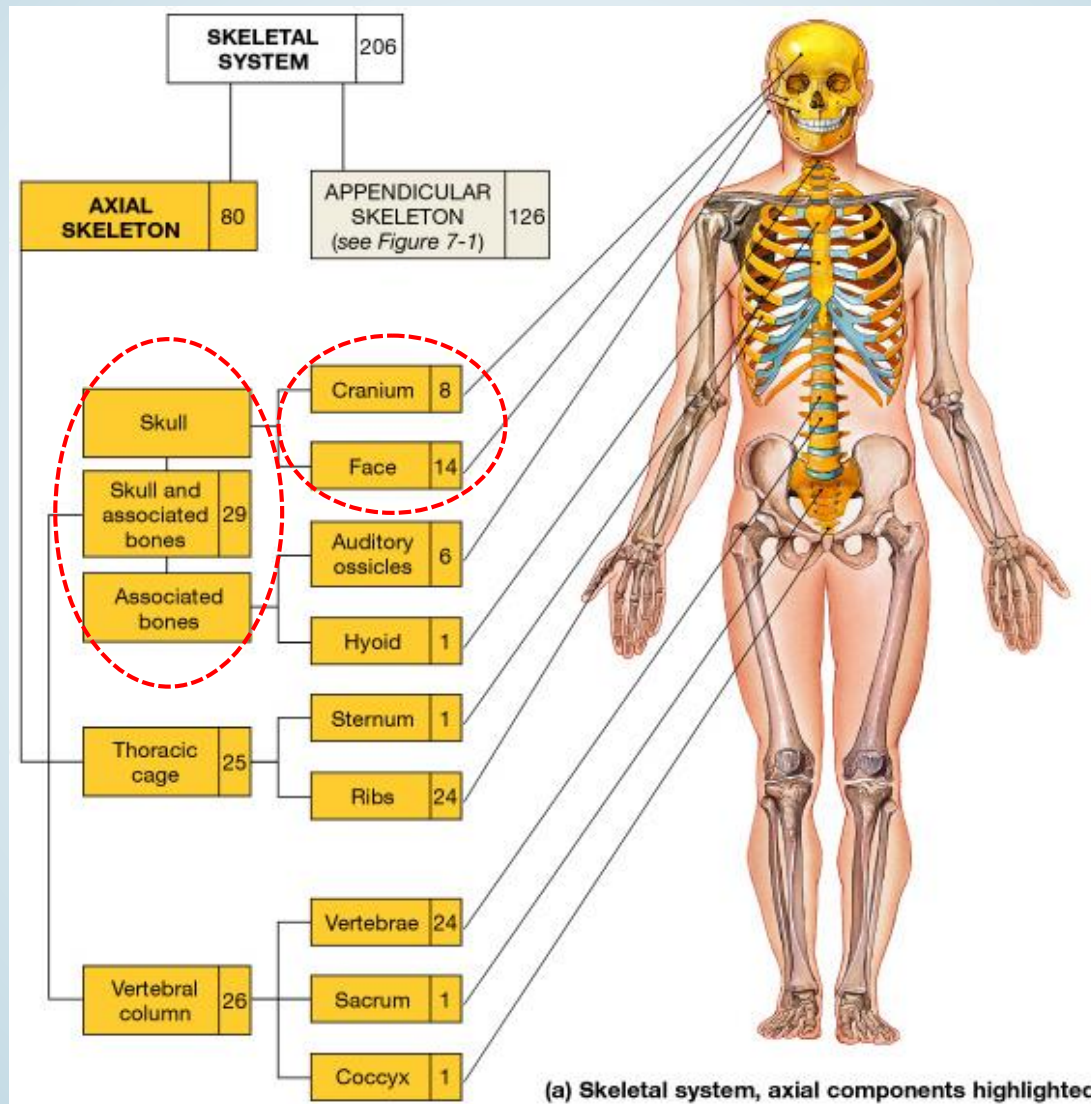


*„To be, or not to be, that is the question...“  
(by: William Shakespeare  
from Hamlet, spoken by Hamlet)*

Ph.D., M.D. David Lendvai

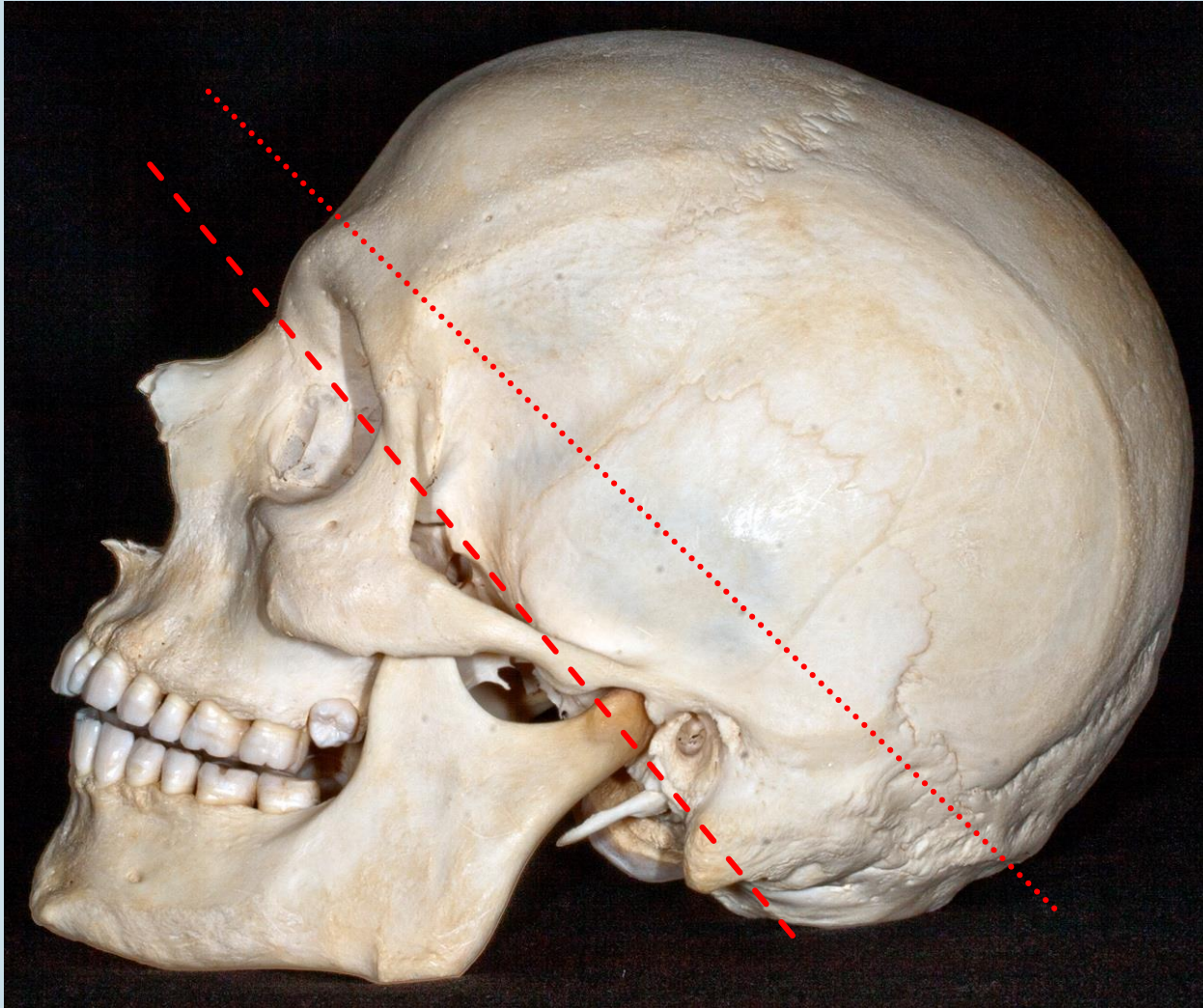
Department of Anatomy, Histology and Embriology  
Semmelweis University, Faculty of Medicine  
2019.

# Skeletal system





# Structure of the skull



- - - - Border between viscerocranium and neurocranium

..... In the dissection room (calvaria)

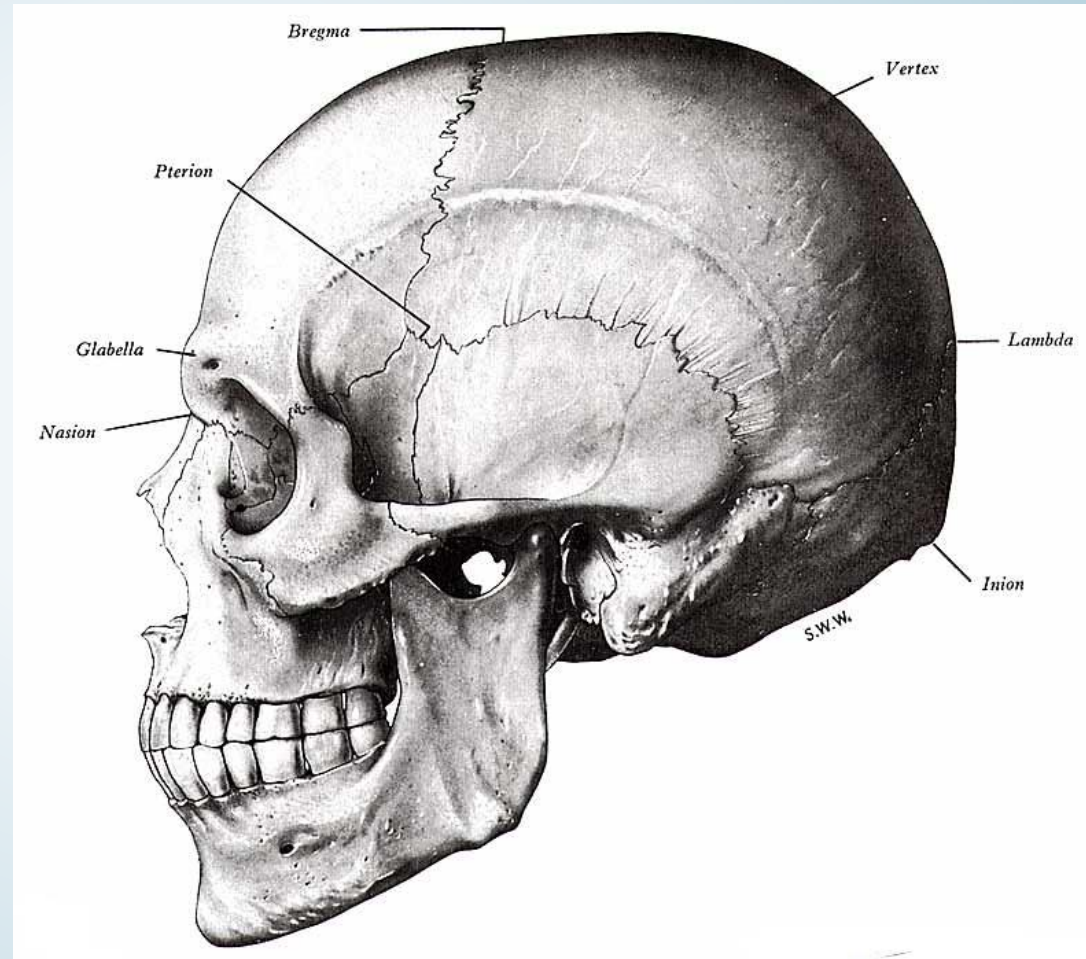




# CRANIUM CEREBRALE

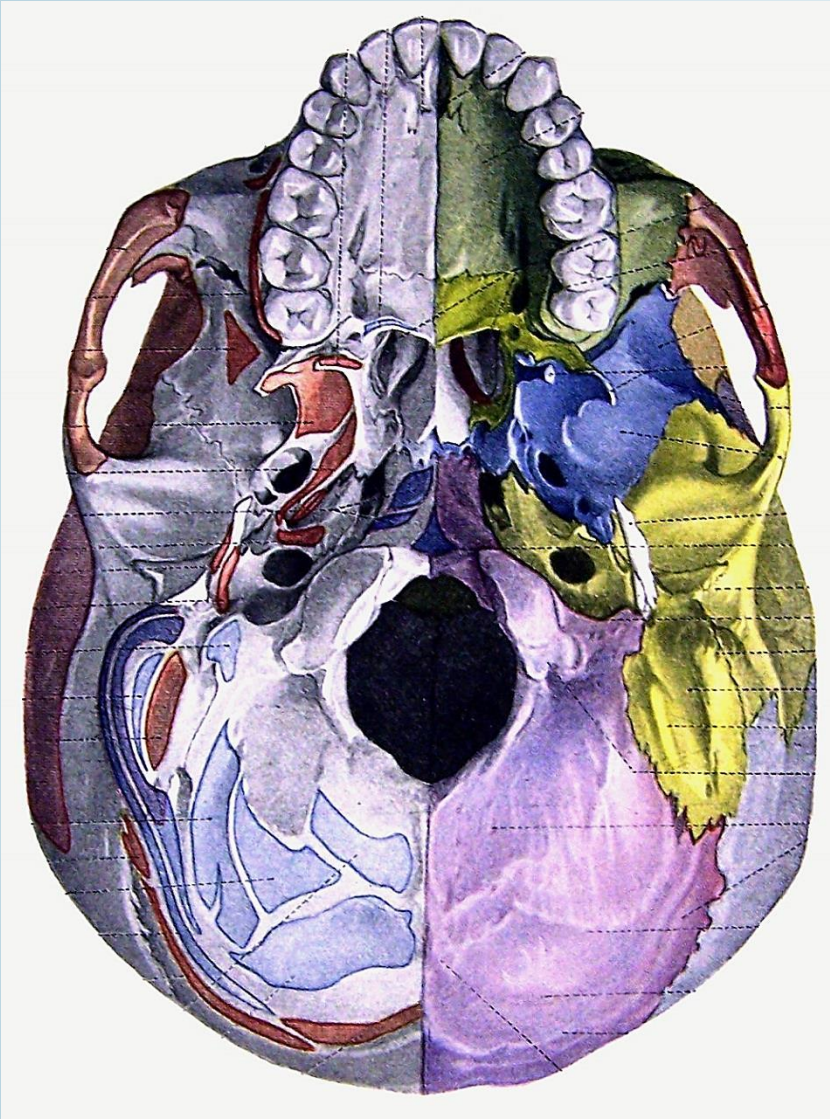
1. calvaria
2. Skull base:
  - Basis cranii int.
  - Basis cranii ext.

Protub. occip. ext. → linea nuchae  
sup. → beginning of the linea  
temp. → zygomatic arch →  
infratemp. crest → ala major →  
zygomatic process →  
supraorbital margin →  
nasofrontalis suture



# External skull base

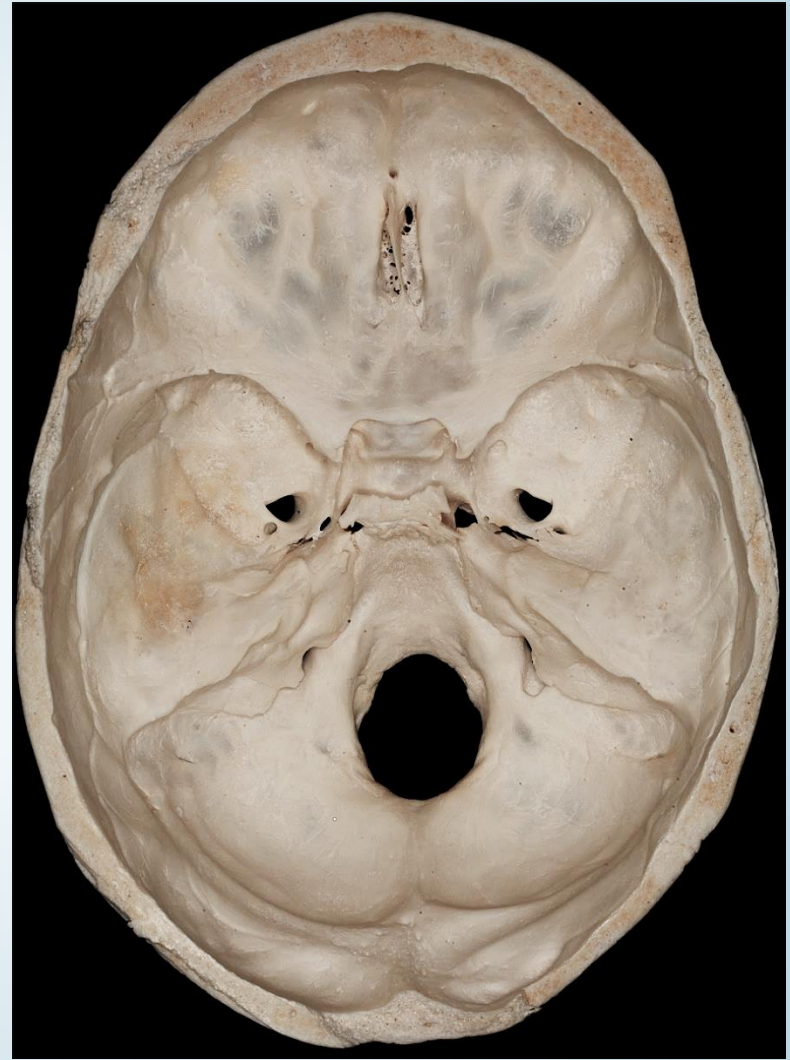
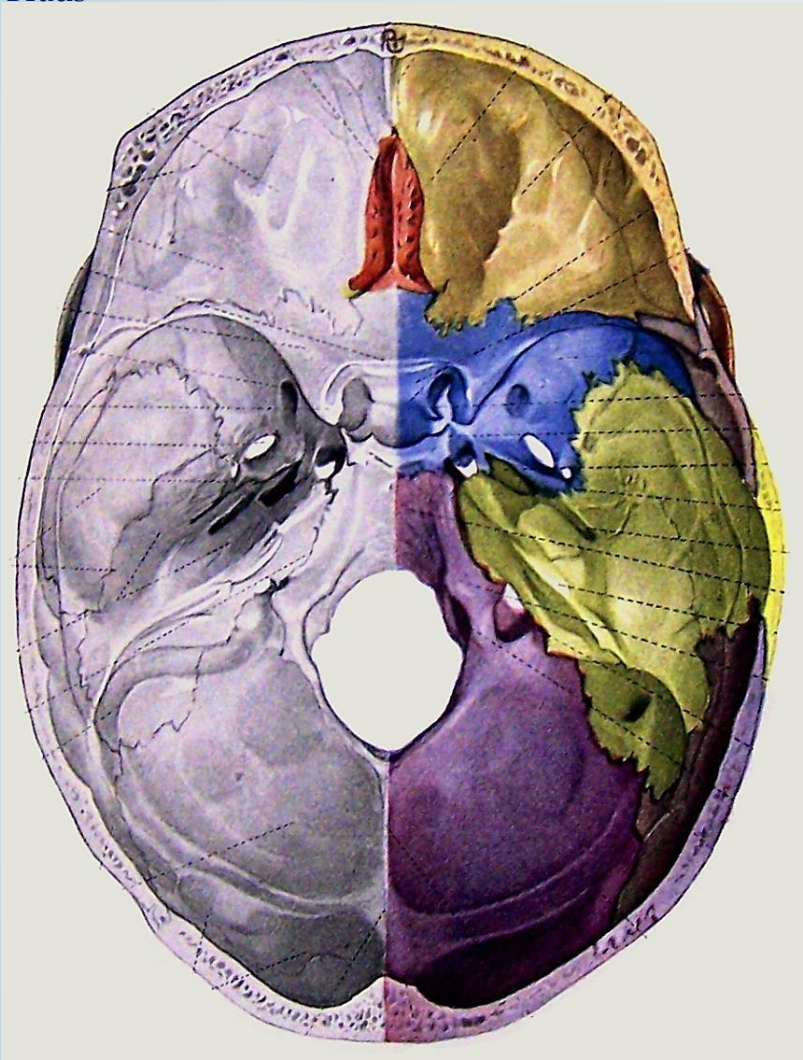
Braus





# Internal skull base

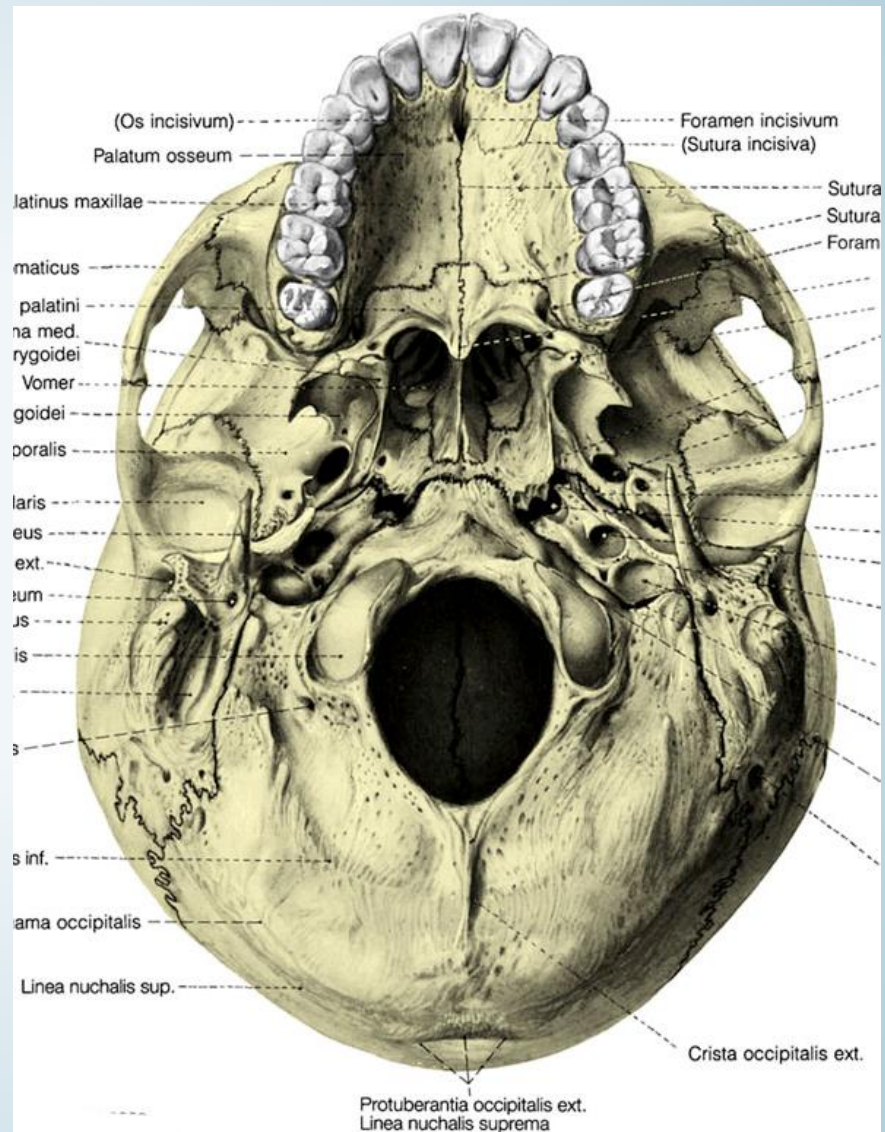
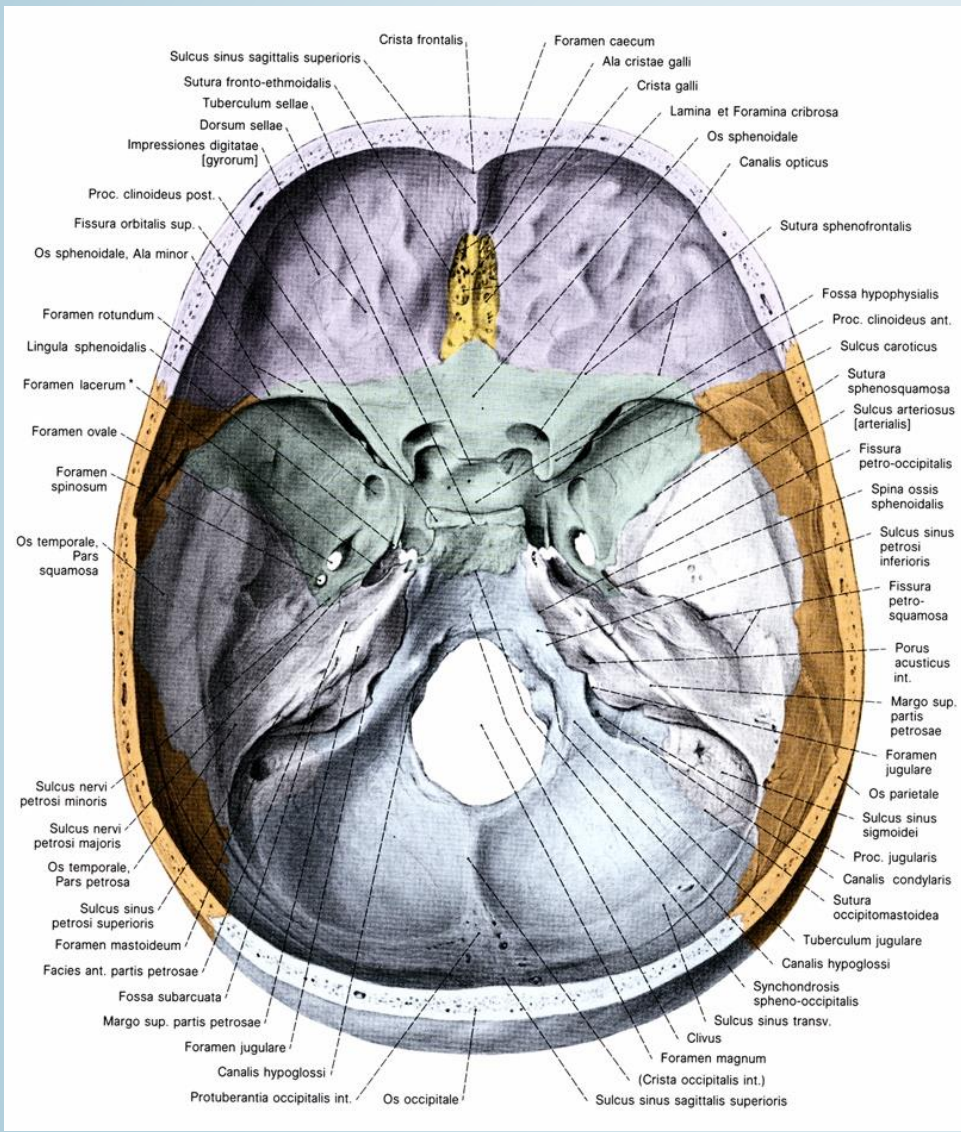
Braus





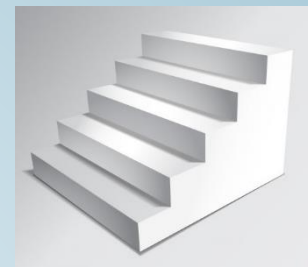


# BASIS CRANII EXT. AND INT.





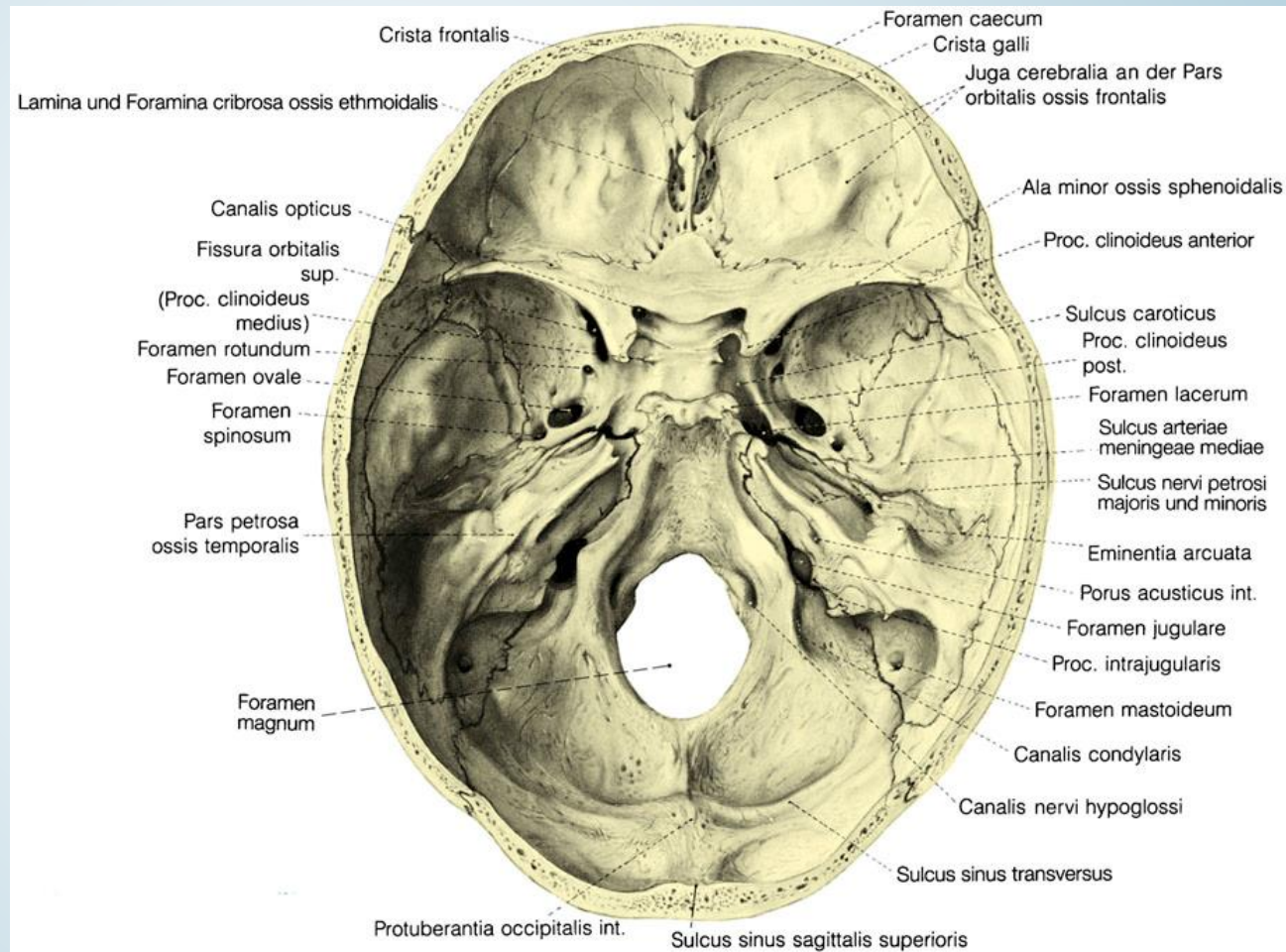
# BASIS CRANII INTERNA



Fossa cranii ant.

Fossa cranii media

Fossa cranii post.





# FOSSA CRANII ANT.

## Formed by:

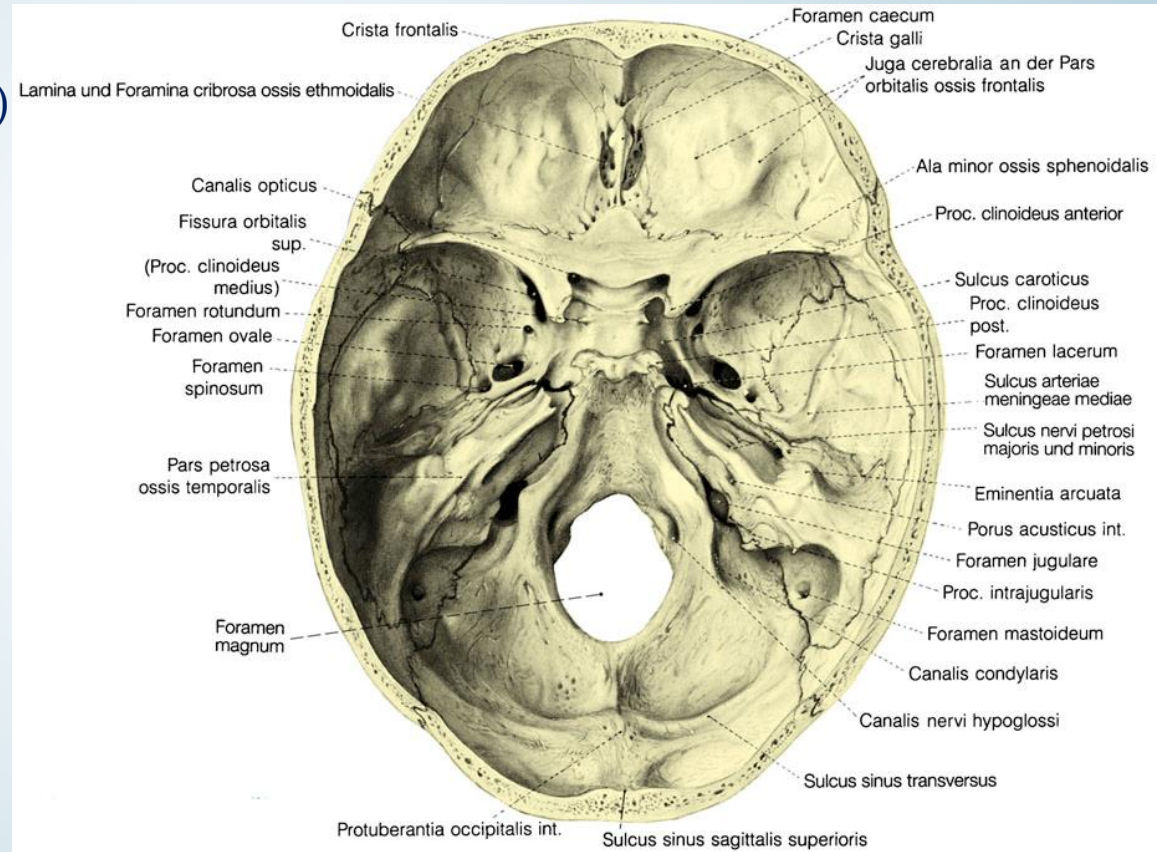
- Os ethmoidale (lamina cribrosa)
- Os frontale (pars orbitalis)
- Os sphenoidale (jugum sphenoidale, alae minores)

## Borders:

- Alae minores
- Sulcus prechiasmatis

## Connections:

- Foramen coecum → nasal cavity
- Foramina et lamina cribrosa → Nasal cavity



# FOSSA CRANII MED.

## Formed by:

Mittlerer Teil (pars sellaris):

- Corpus ossis sphenoidalis

Lat. Teilen (p. temporalis):

- Ala major ossis sphenoidalis
- Os temporale: p. squamosa, p. Petrosa facies ant.

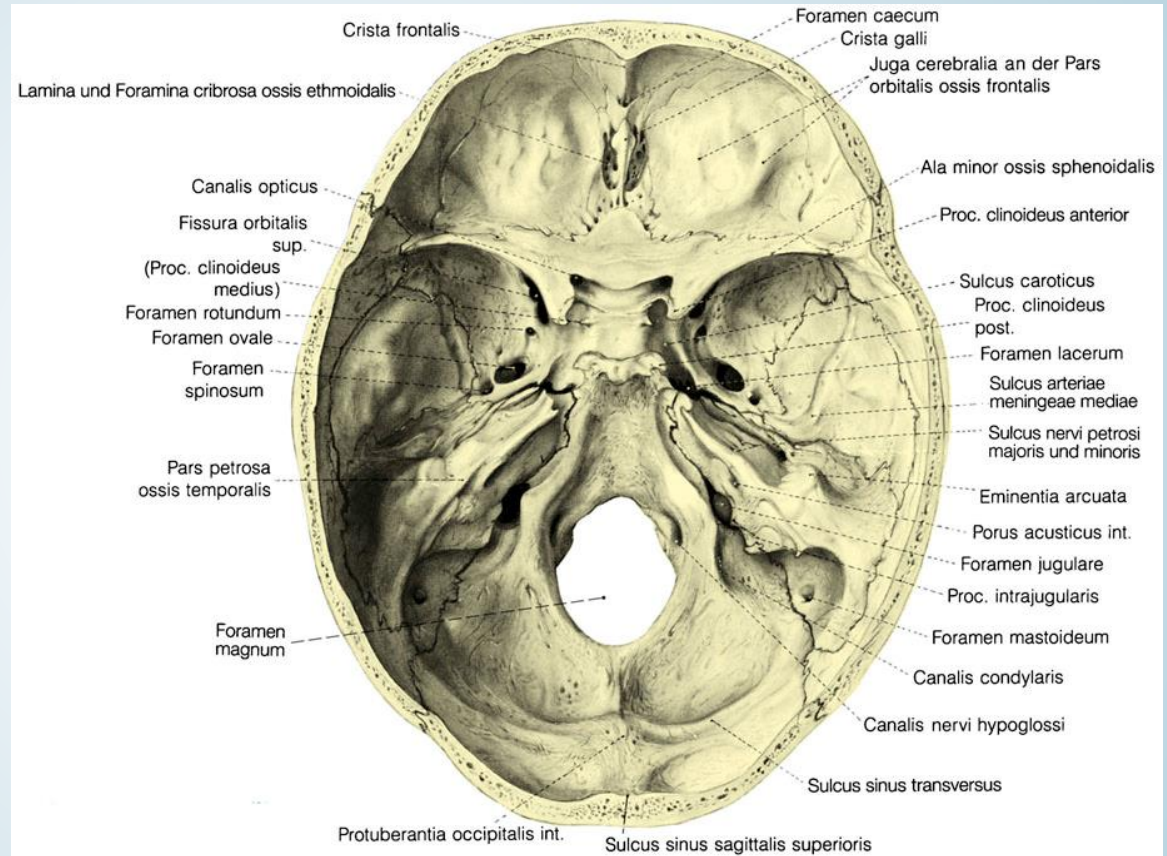
## Borders :

anterior:

- Ala minor,
- Sulcus prechiasmatis

posterior:

- Dorsum sellae
- Margo sup. partis petrosae





# FOSSA CRANII MED.

## Connections:

Canalis opticus → orbita

Fissura orbitalis sup. → orbita

Foramen rotundum →

fossa pterygopalatina

Canalis nervi petrosi majoris → canalis facialis

Canalis nervi petrosi minoris → Paukenhöhle

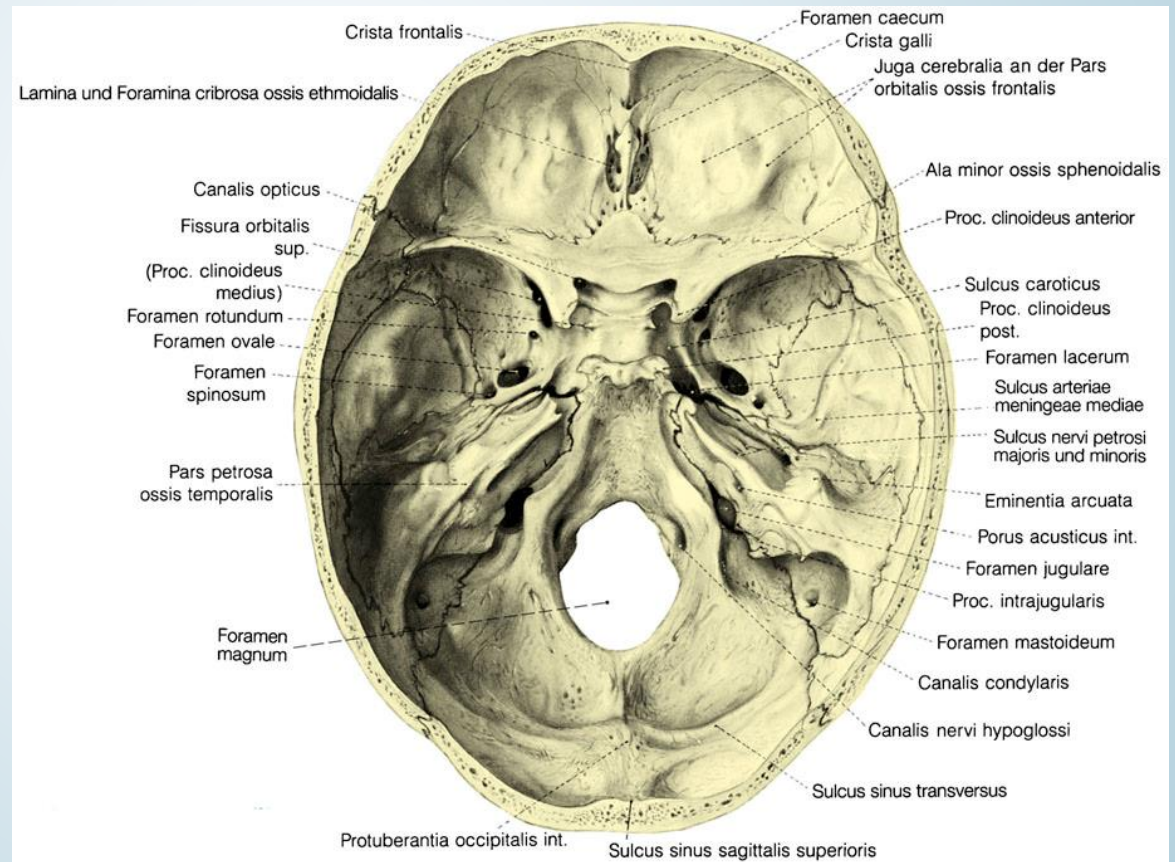
Foramen spinosum

Foramen ovale

Canalis caroticus

Foramen lacerum

Fissura sphenopetrosa



## FOSSA CRANII POSTERIOR

### Formed by:

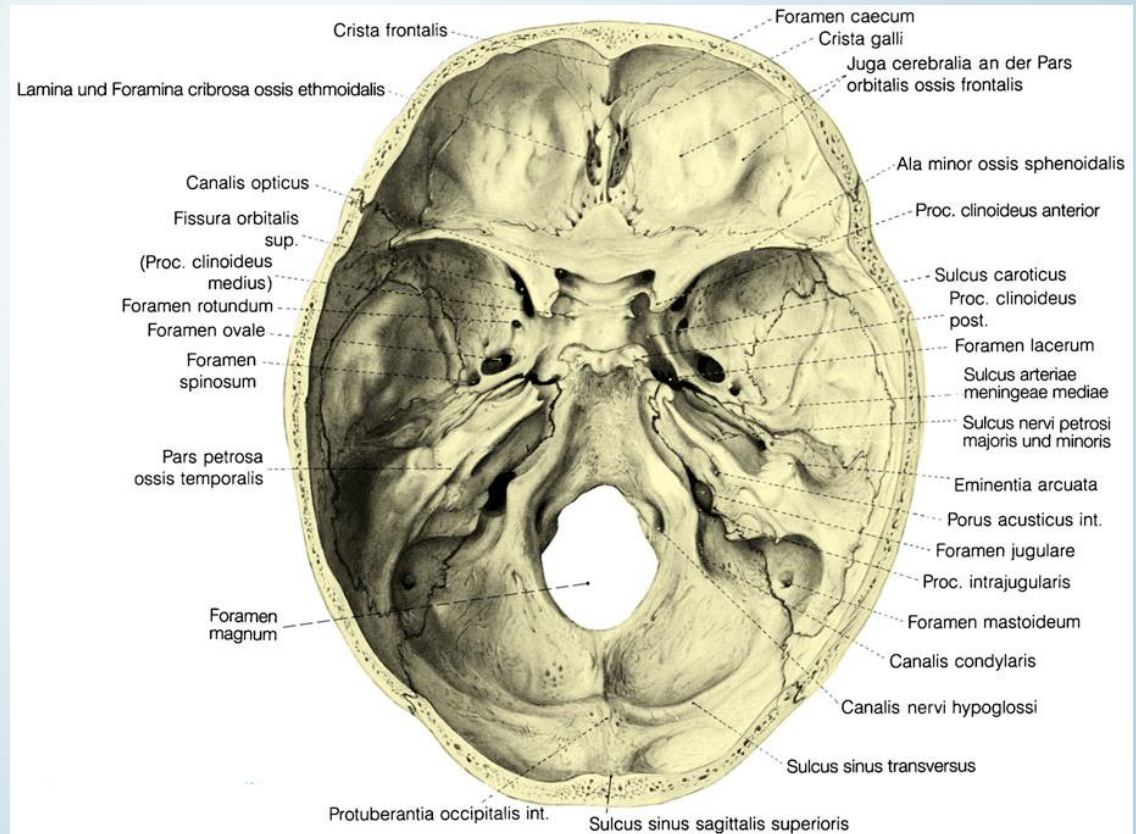
- Os occipitale
- Os temporale (p. mastoidea, facies post. Partis petrosae)
- Os sphenoidale (dorsum sellae)

### Borders:

- Dorsum sellae obere

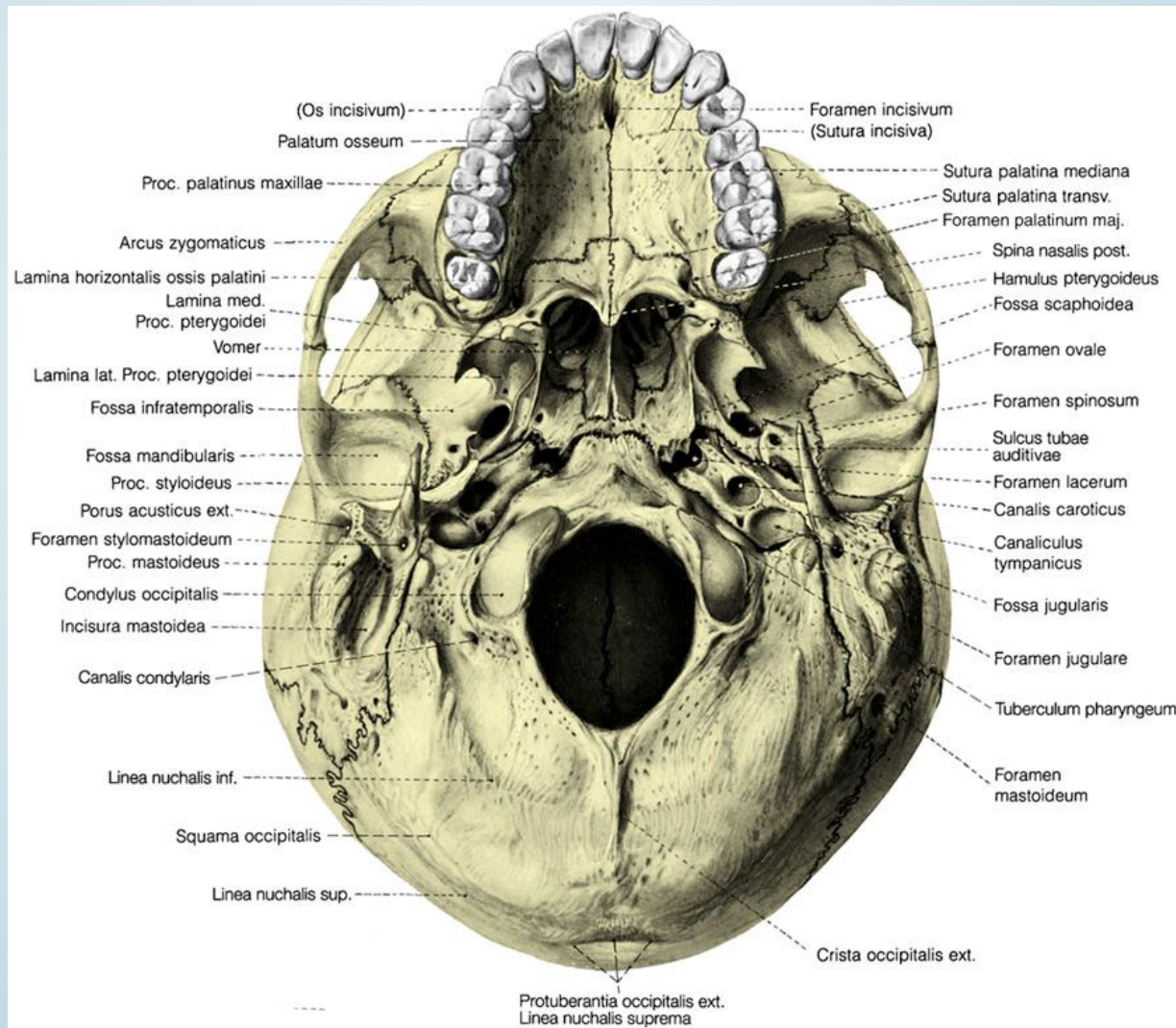
### Grenze

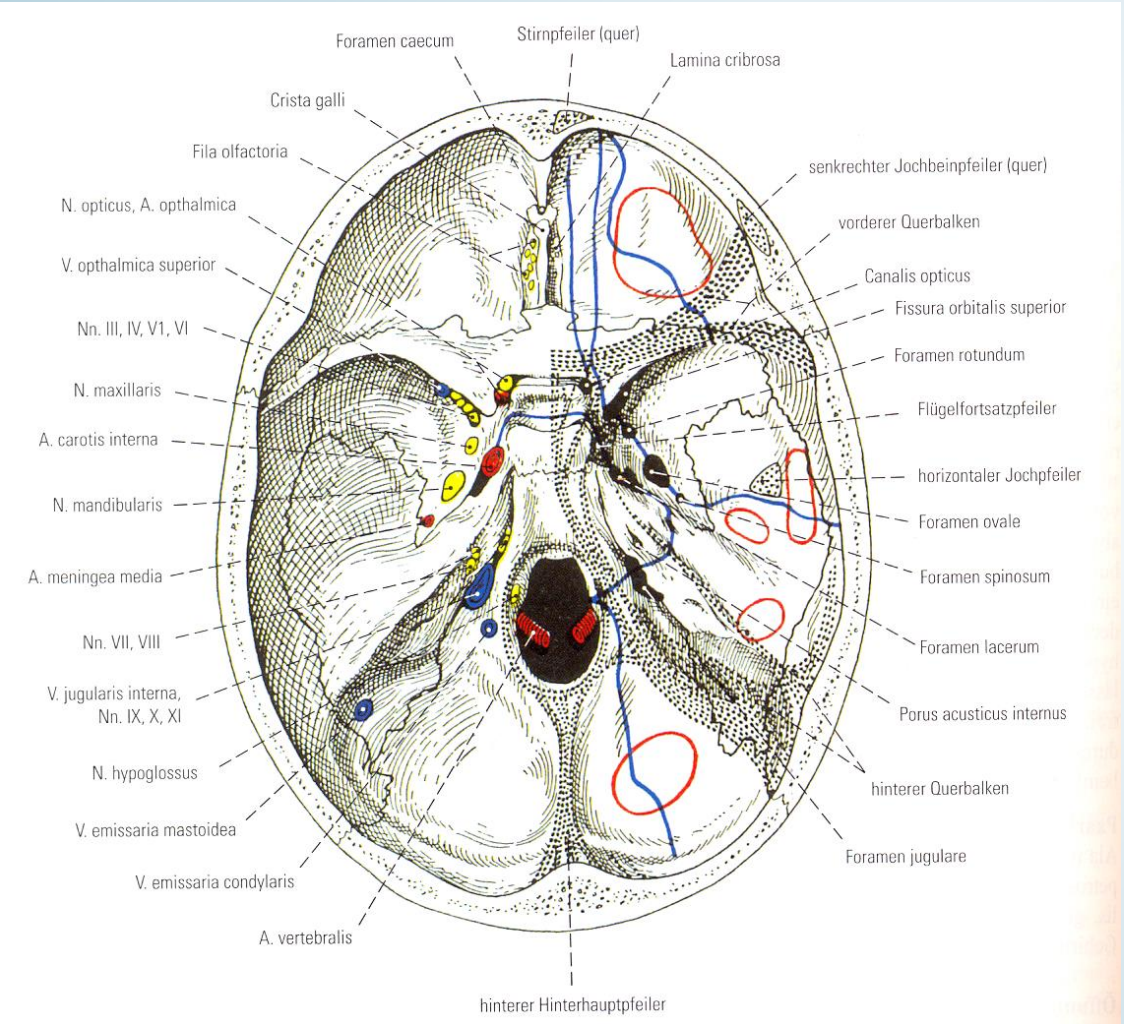
- Margo sup. partis petrosae
- Protuberantia occipitalis int.
- Sulcus sinus transversi





# BASIS CRANII EXTERNA





Fractures of the skull:

Fossa cranii ant.:  
 Raccoon eye hematoma Nasan  
 bleeding with liquor

Fossa cranii media:  
 Bleeding from the ear

Fossa cranii post.:  
 Hematoma behind the proc.  
 mastoid, bleeding in the  
 spatium retropharyngeum

**Red: weak areas**

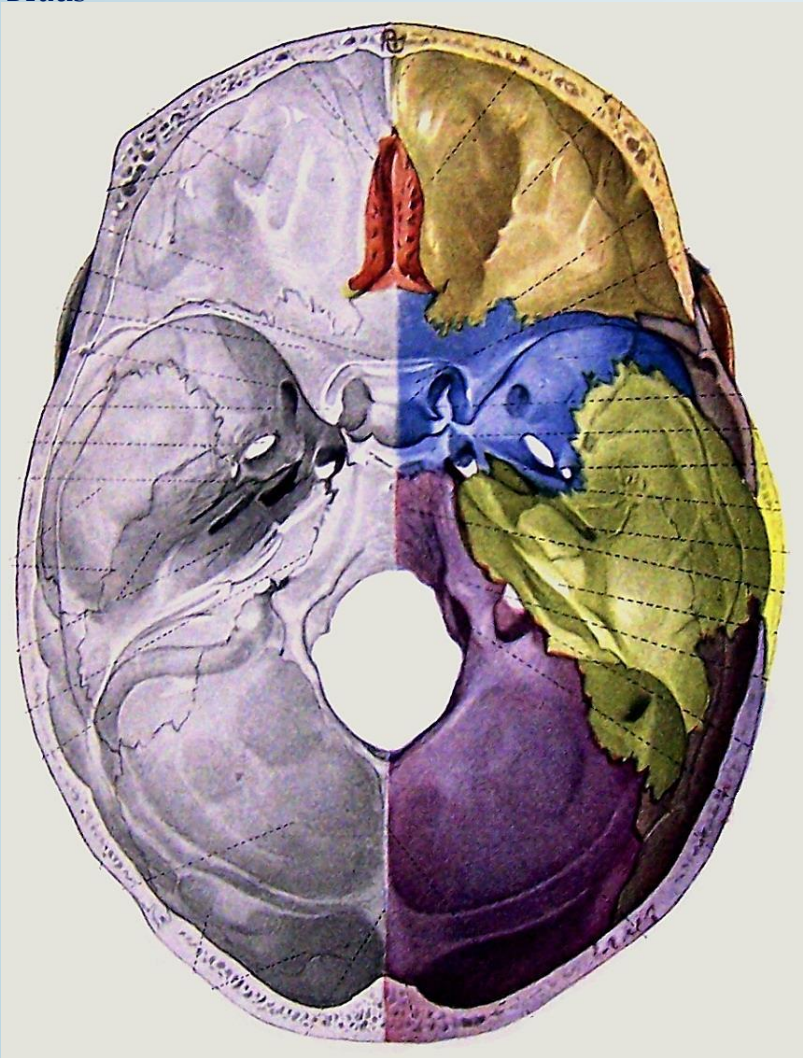
**Black spotted: Reinforced  
 bones in the direction of the  
 lines of force**

**Blue: typical break lines**



# Internal skull base

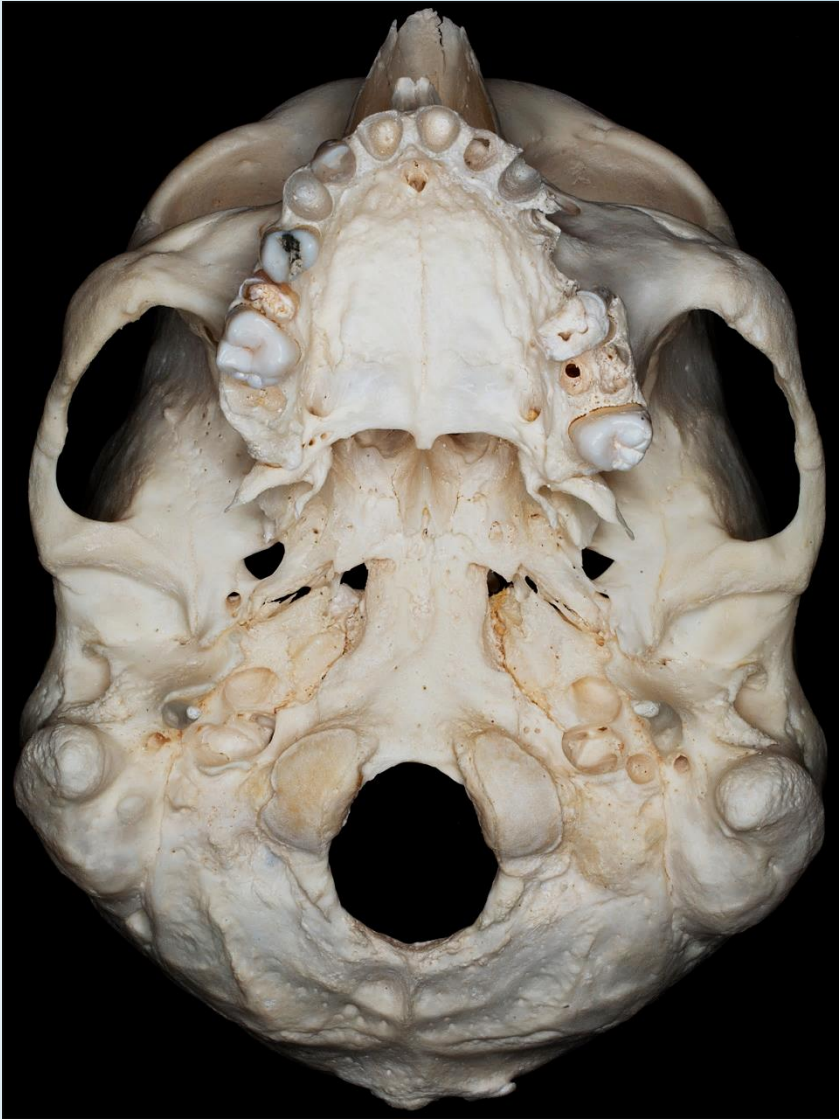
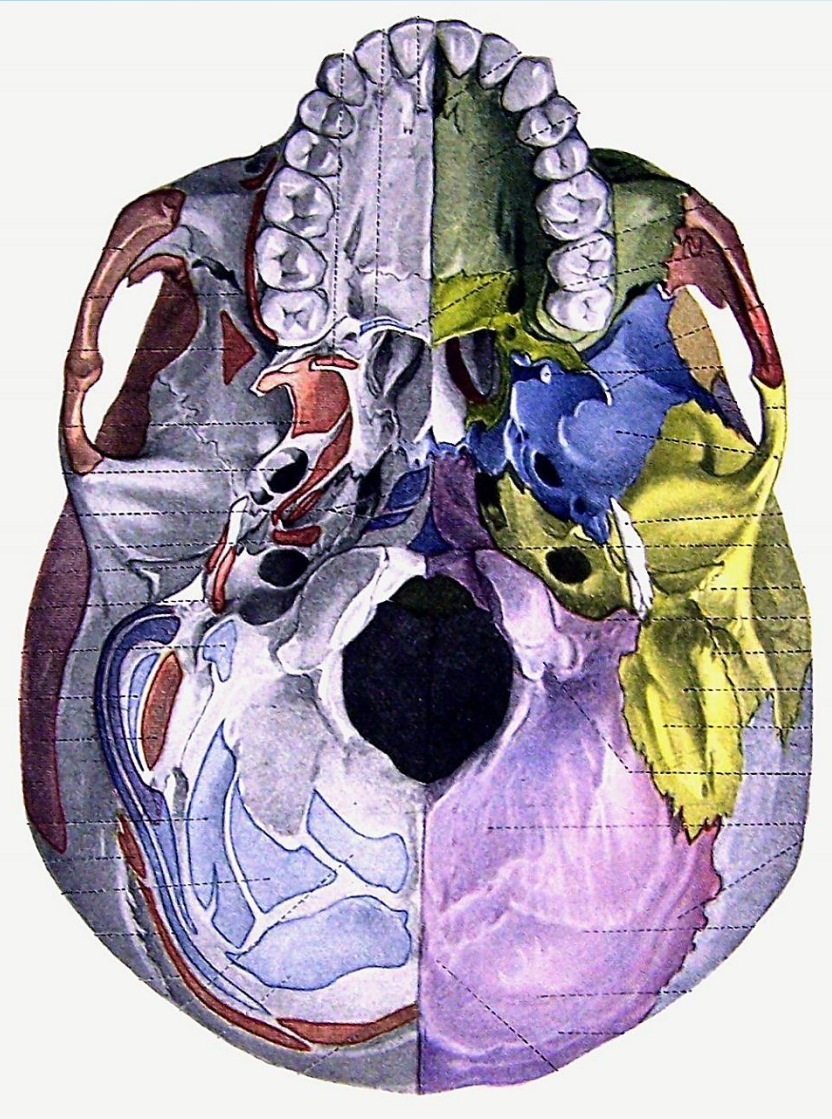
Braus





# External skull base

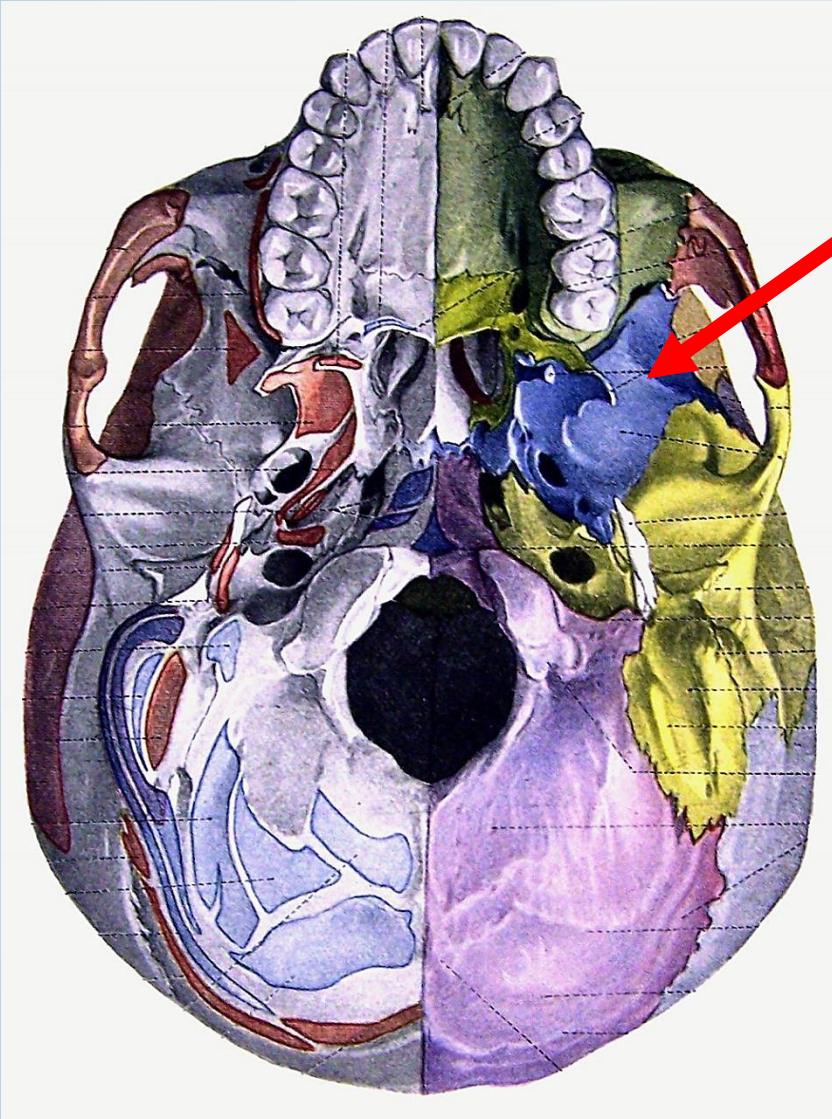
Braus





# Sphenoid bone

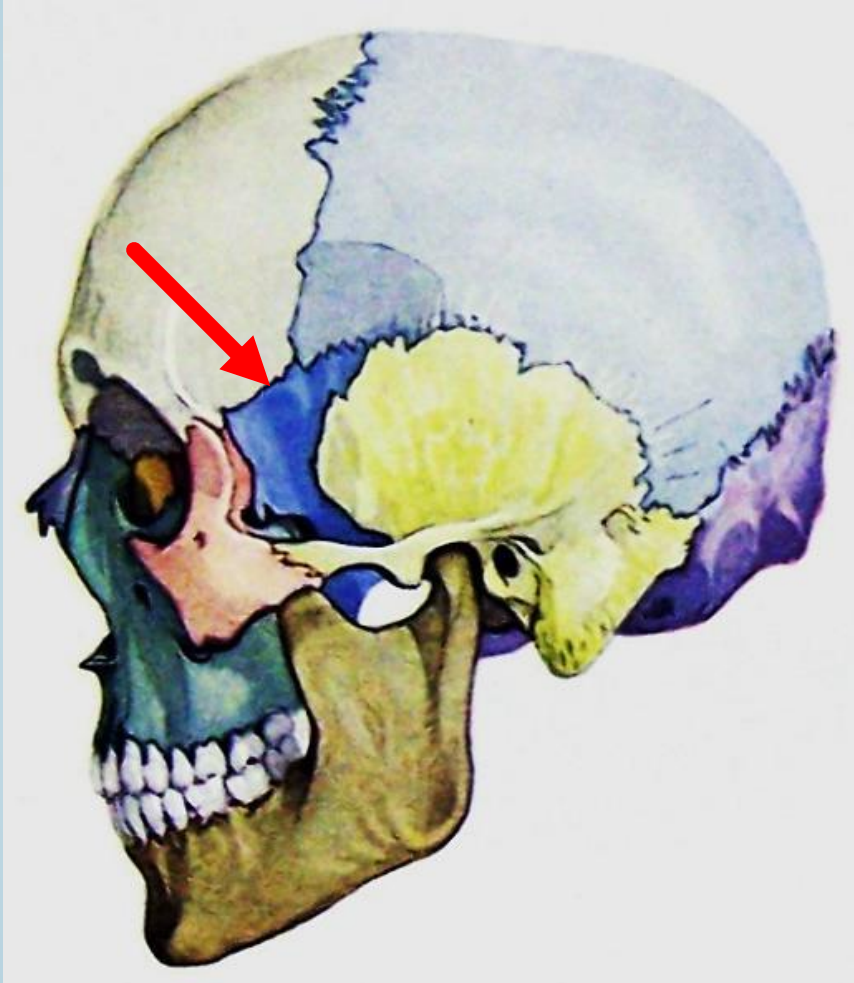
Braus



Part of the external skull base (- body (Corpus), pterygoid process, greater wing (Ala major)

# Sphenoid bone

Braus

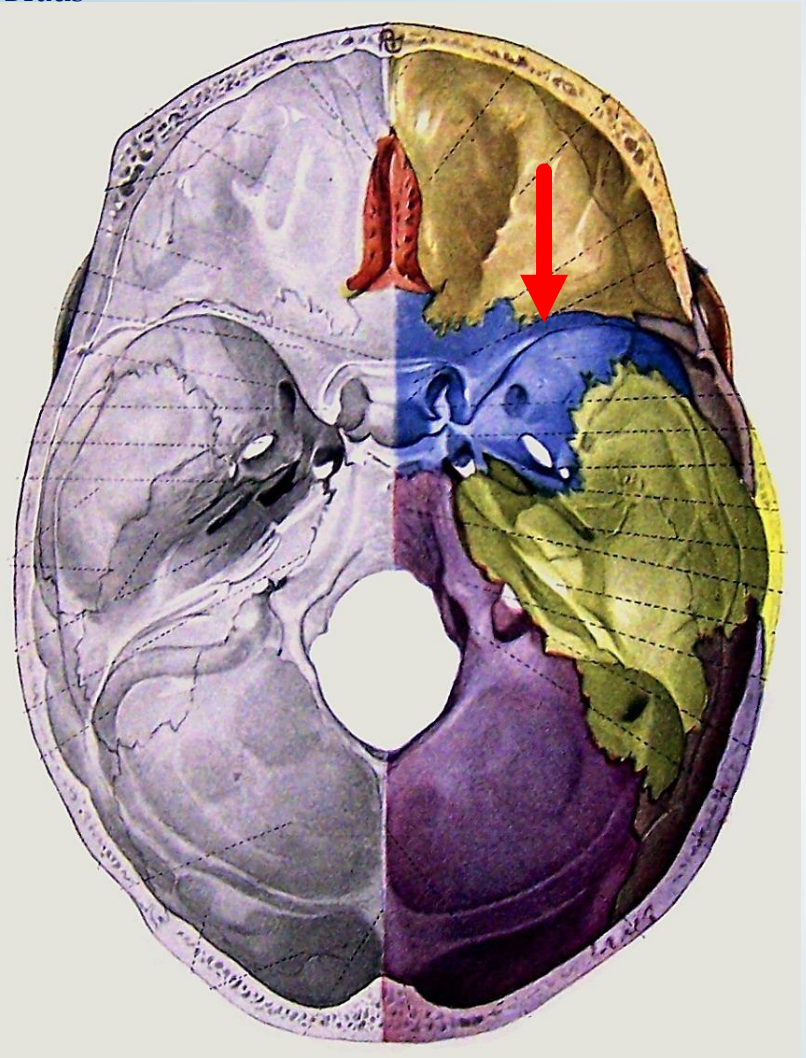


Part of the temporal fossa, greater wing (Ala major)



# Sphenoid bone

Braus



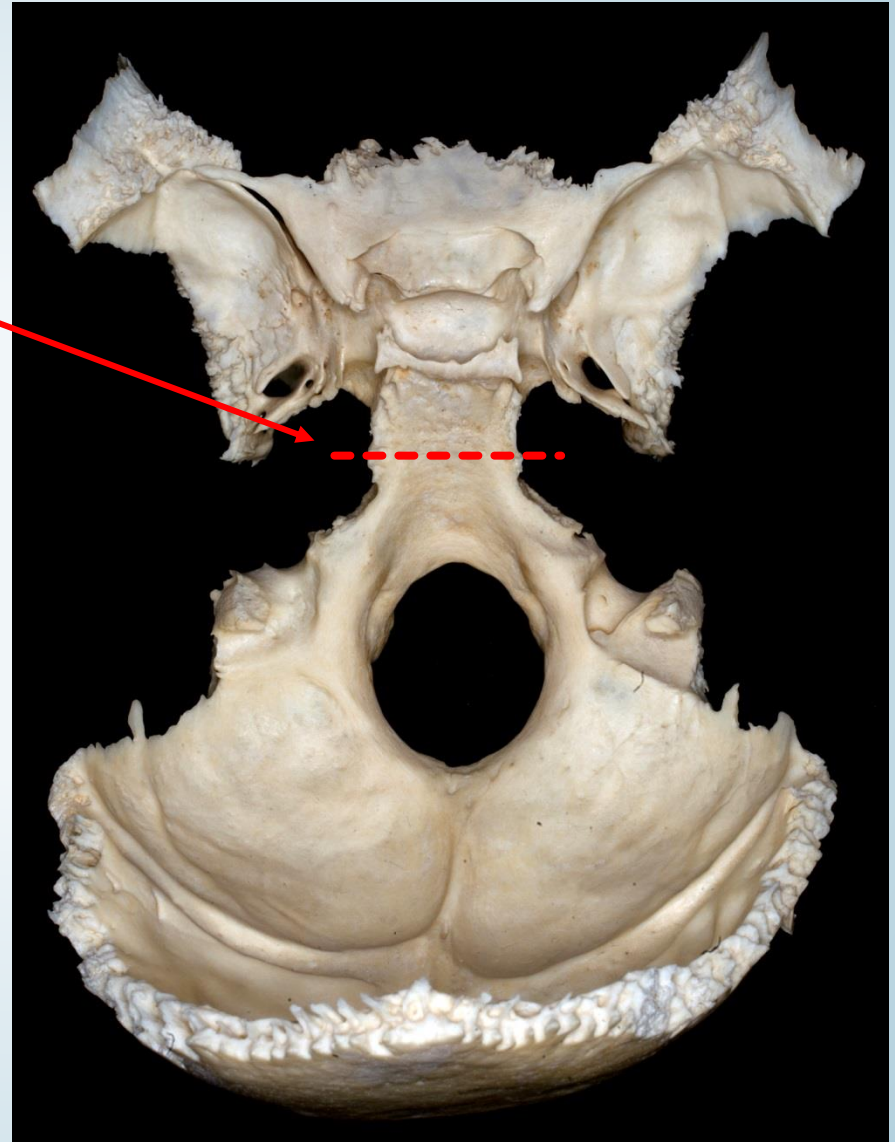
Part of the internal skull base (Corpus, Ala minor, Ala major)

# Sphenoid bone

**sphenooccipital synchondrosis:**  
ossified in the beginning  
of adulthood

About the age of 18  
can be the occipital bone and the  
sphenoid bone no longer  
separated from each other  
(synostosis)

Connections to the others bones  
by sutures, with the passage of  
time also often ossified





# Sphenoid bone

[www.hrlfg.eoldal.hu](http://www.hrlfg.eoldal.hu)



Os sphecoideum ~ Wasp ~ Os vespiforme

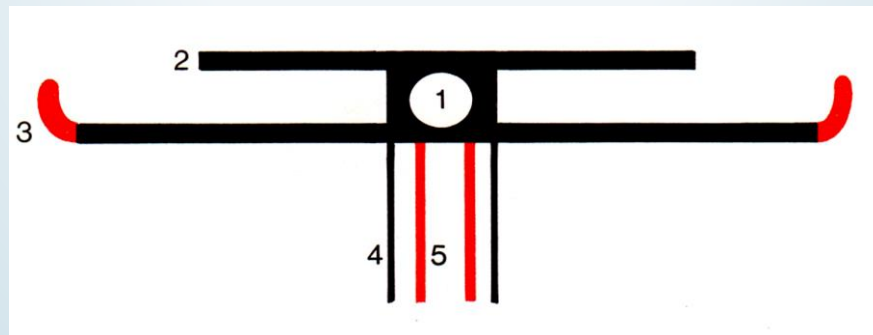
Os sphenoidale = cuneiform

Os cuneiforme, alatum, pterygoideum, polymorphon, carinae, colatorii, paxillare



fotó: Semmelweis Egyetem ©

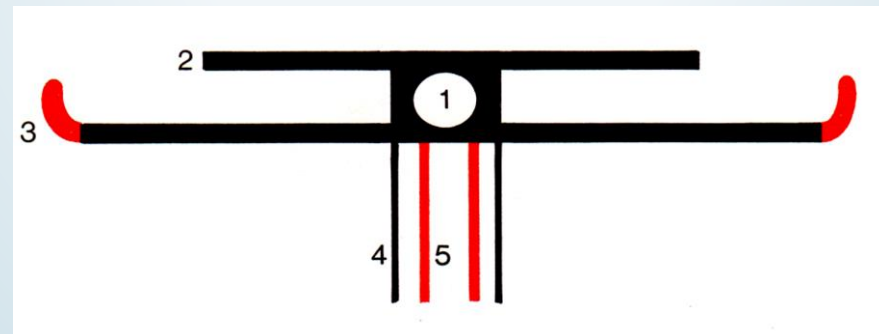
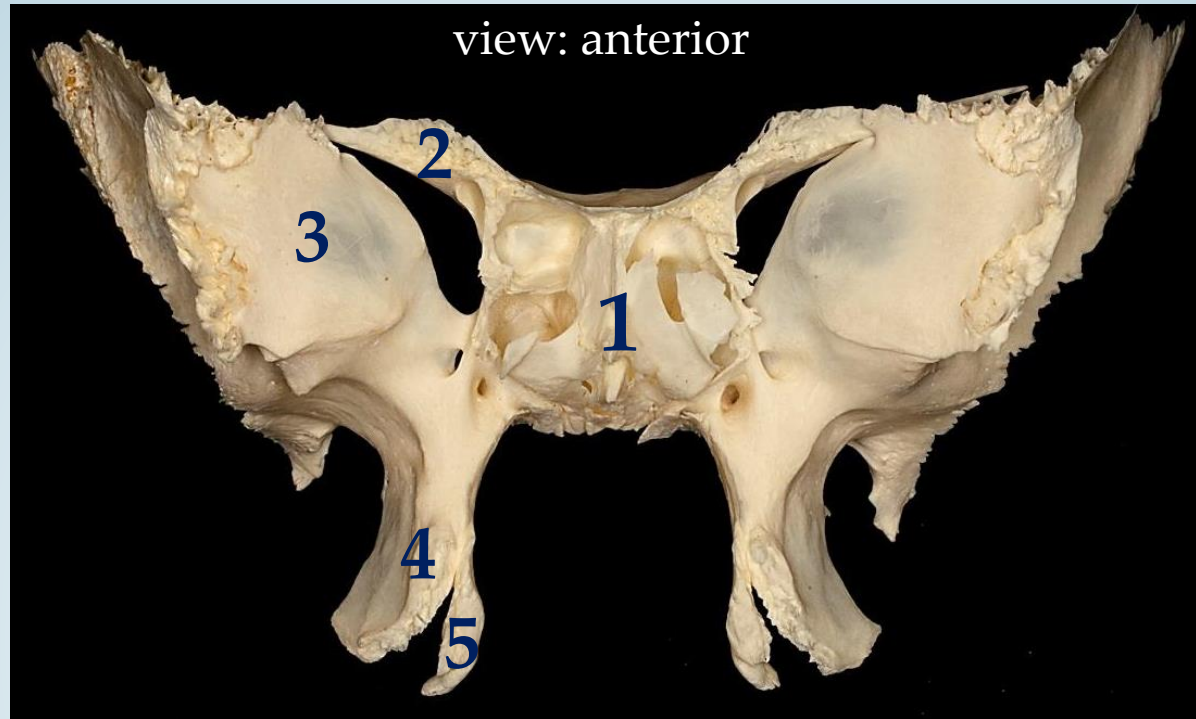




Faller

- 1. sphenoidal sinus
- 2. lesser wing of the sphenoid bone
- 3. greater wing of the sphenoid bone

- 4. lateral pterygoid plate
- 5. medial pterygoid plate



Faller

1. sphenoidal sinus
2. lesser wing of sphenoid bone
3. greater wing of sphenoid bone

4. lateral pterygoid plate
5. medial pterygoid plate



# Sphenoid

## Surfaces of the greater wing:

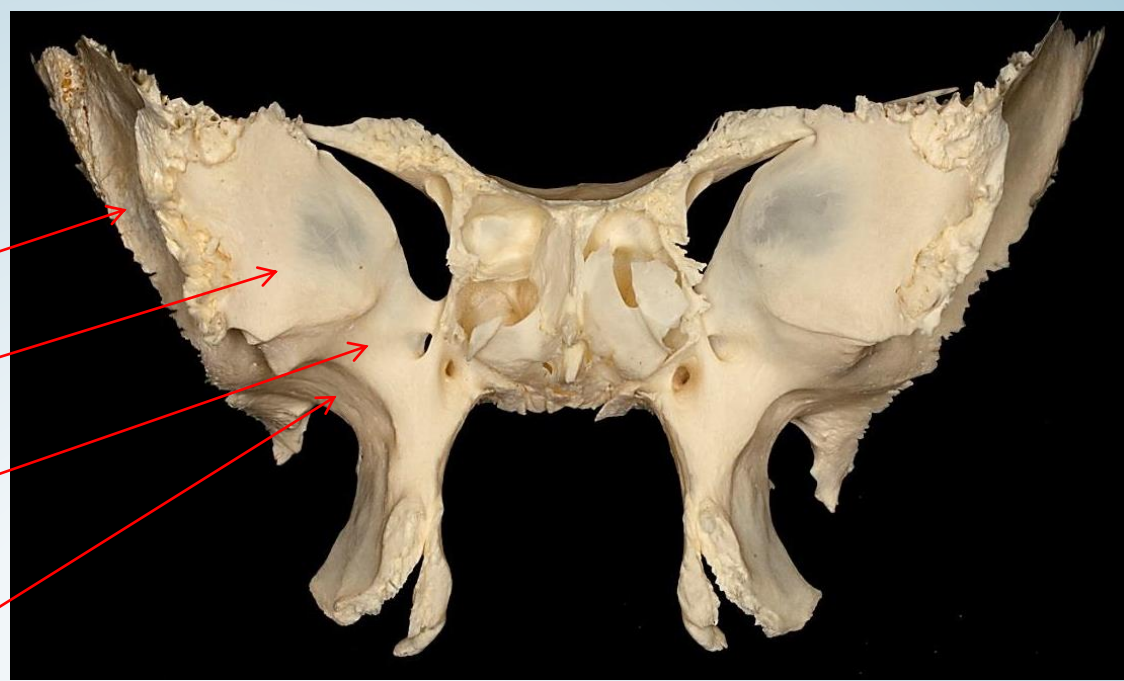
-temporal surface

- orbital surface

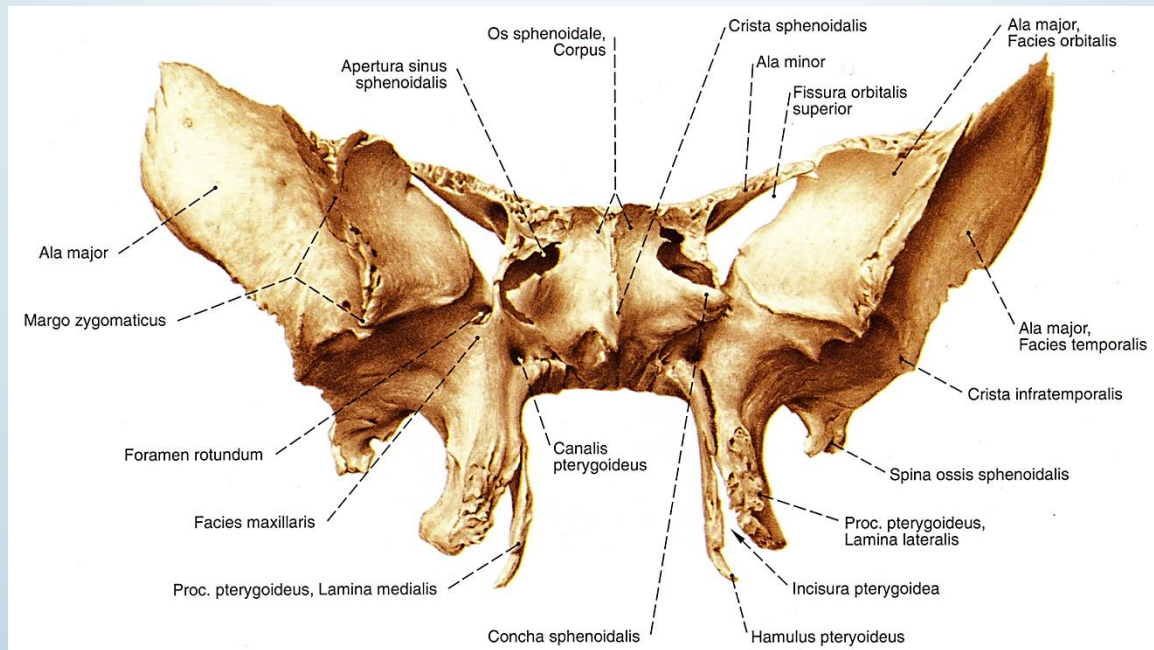
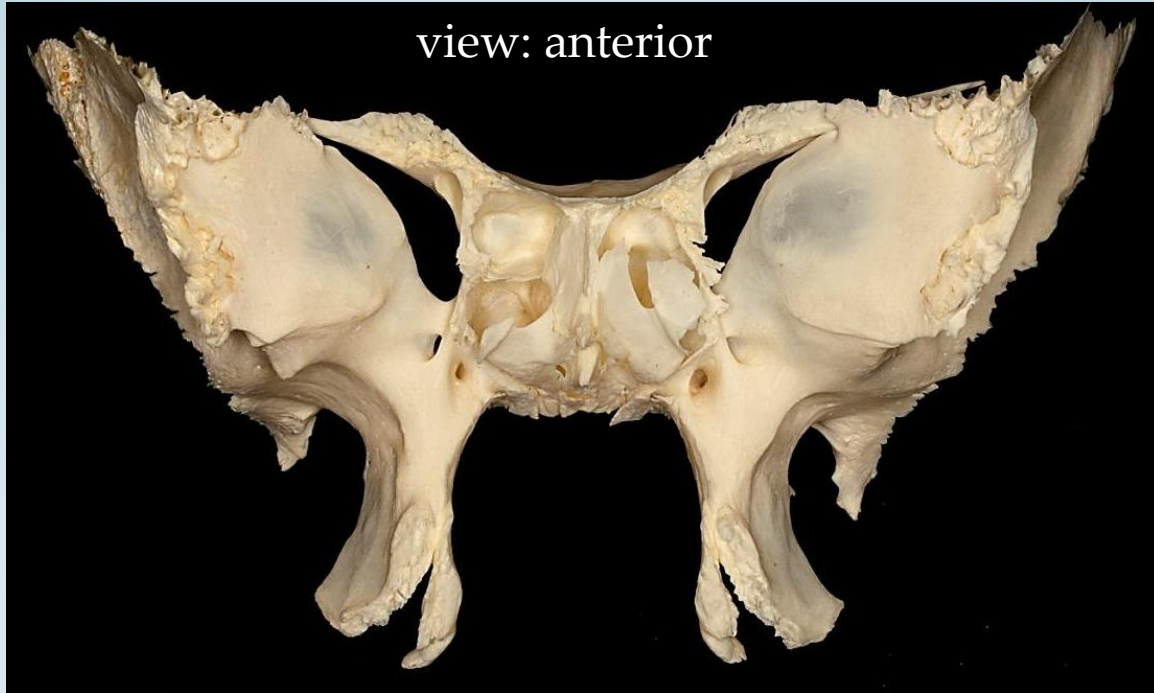
- maxillary surface  
(around the foramen rotundum)

- infratemporal surface

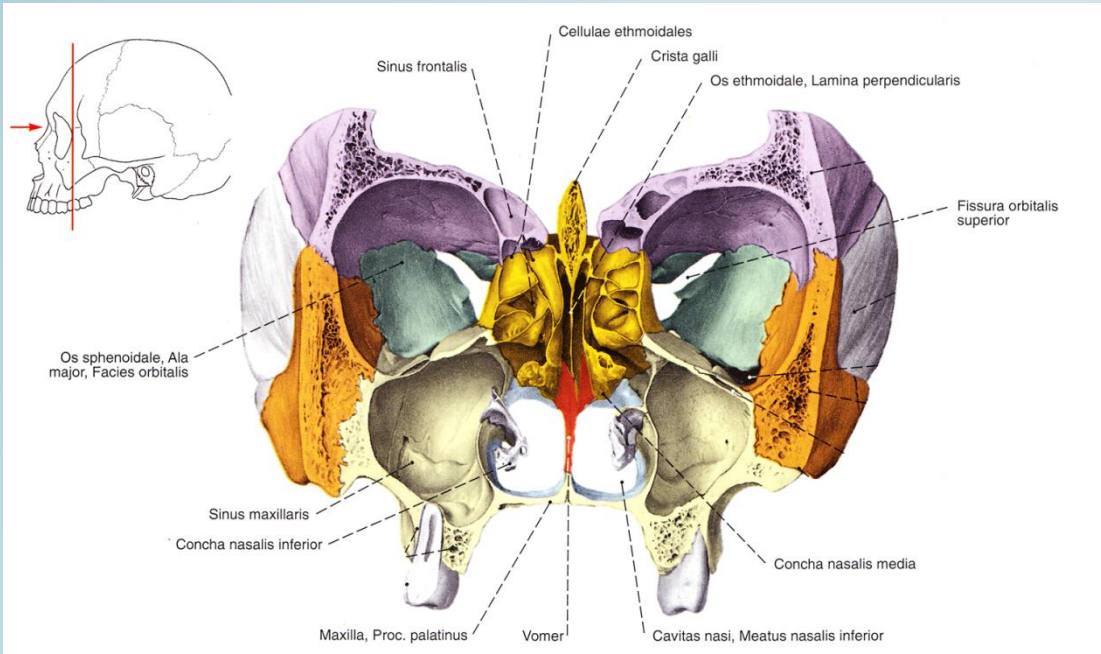
- cerebral surface



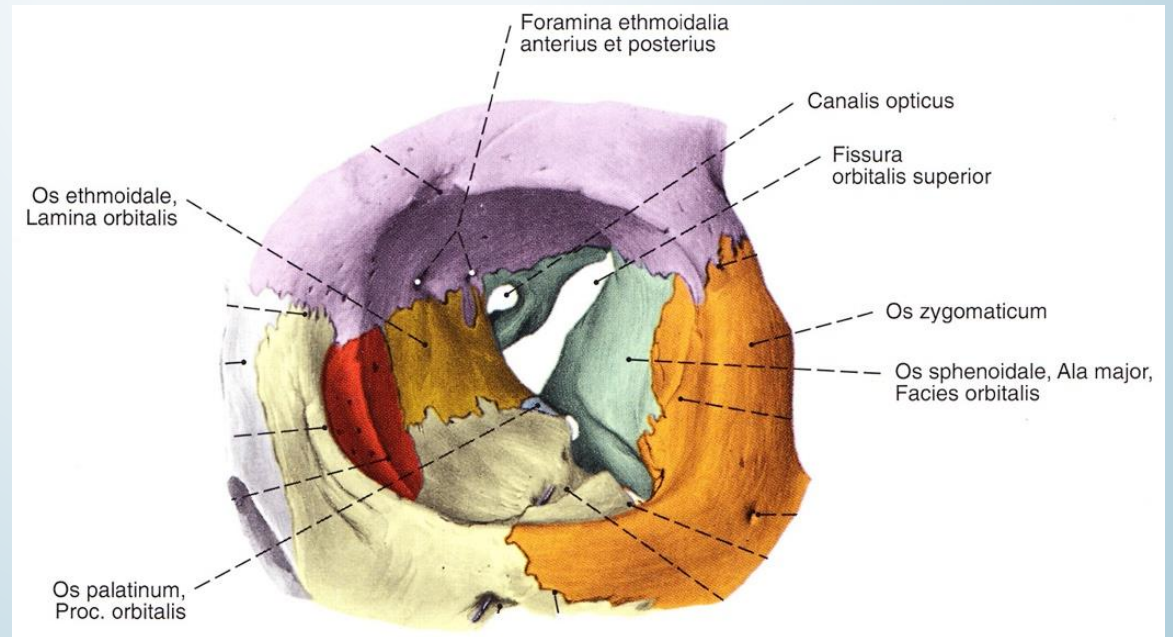
view: anterior

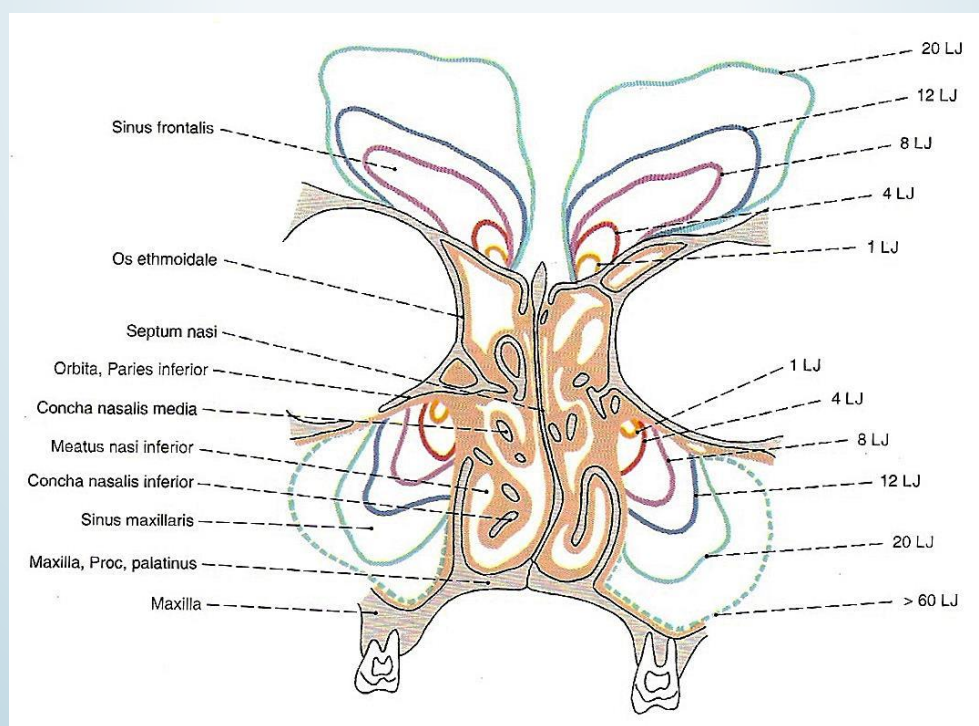
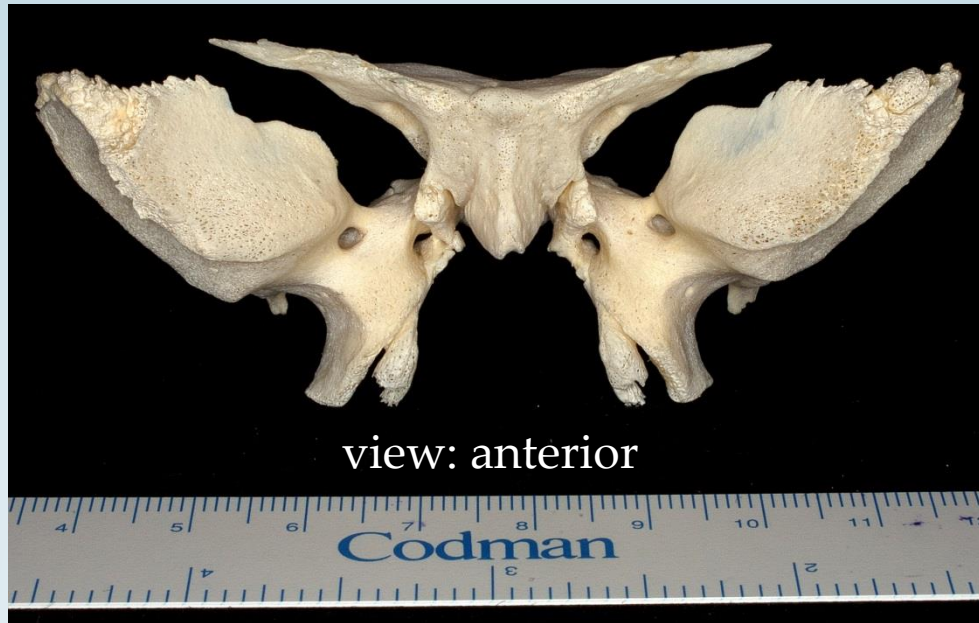






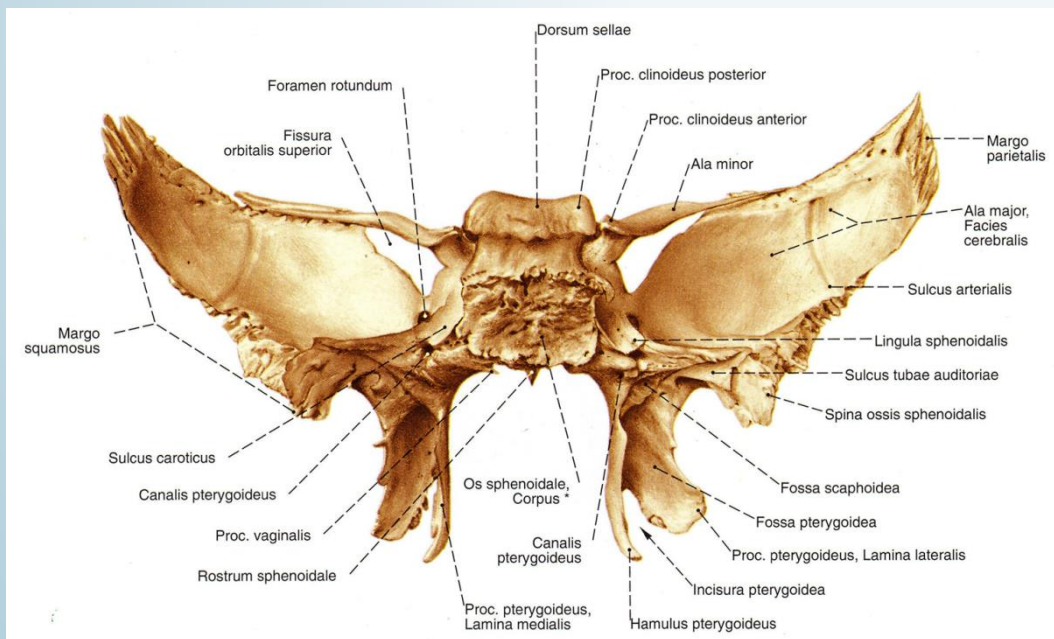
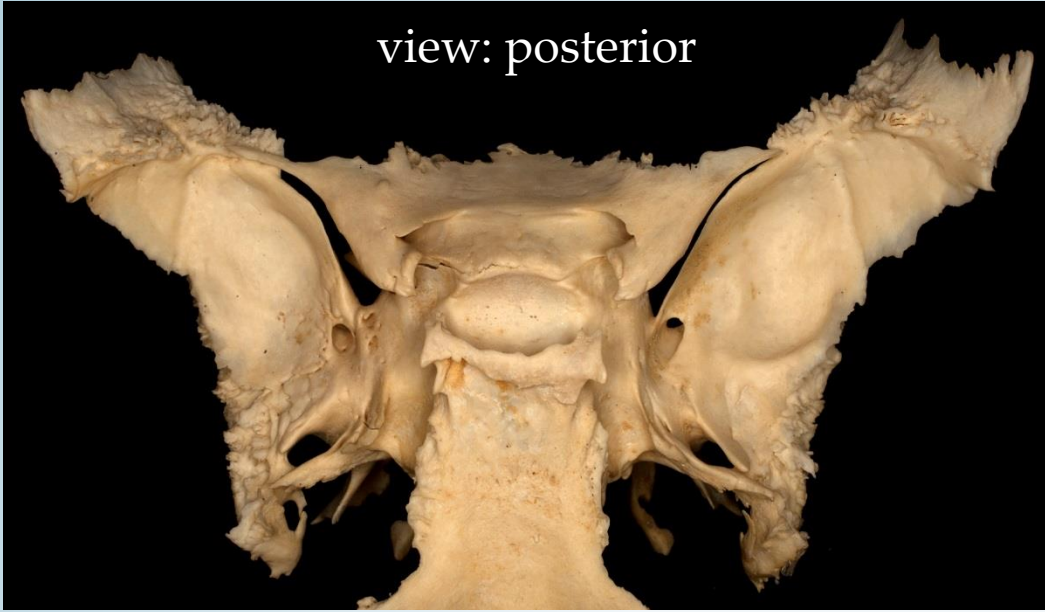
## Formation of the posterior and lateral wall of the orbit







view: posterior



**Proust**  
A la recherche  
du temps perdu



Humanis

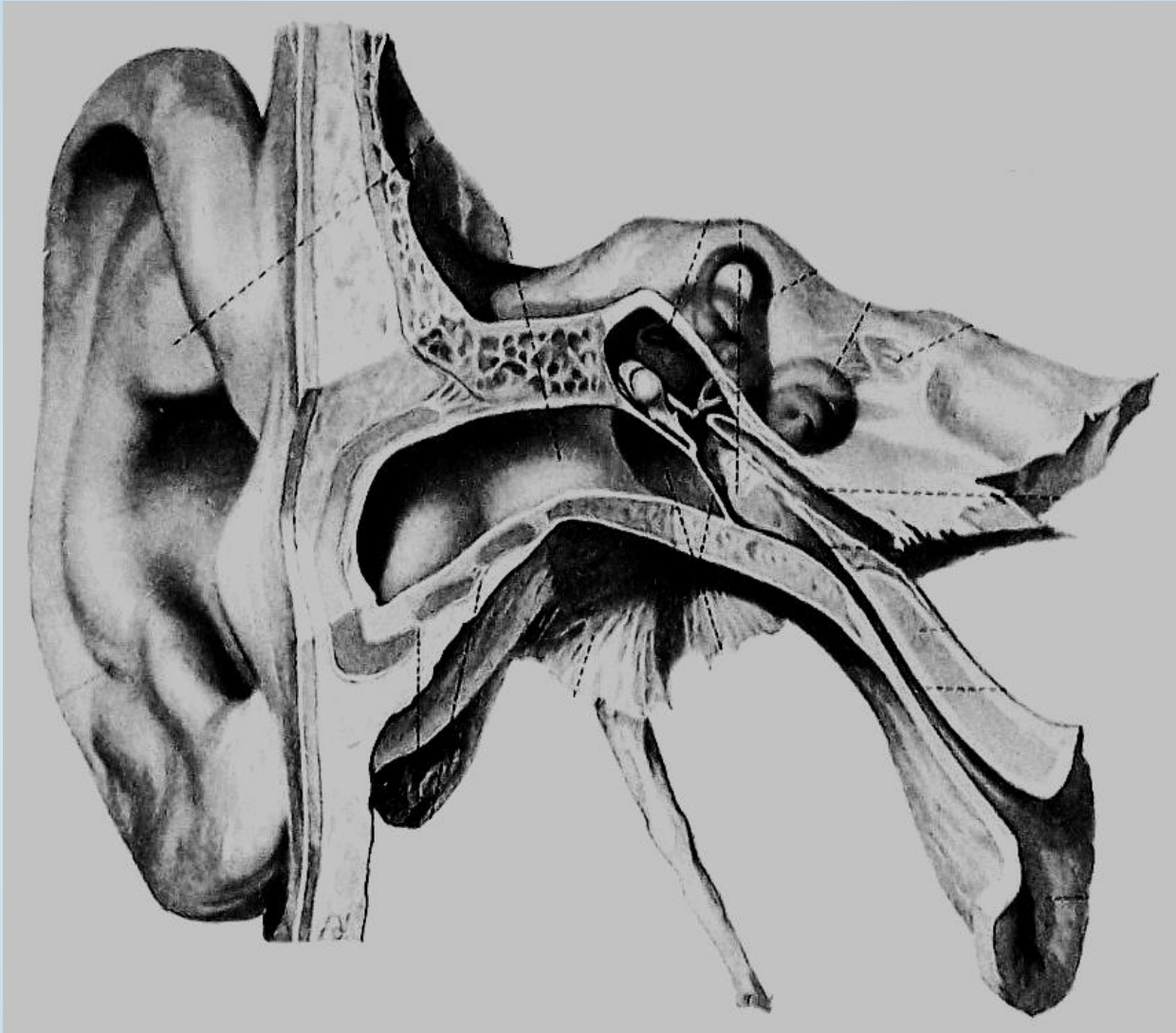
„Fuga temporis” = Time flies

Tempus = Time

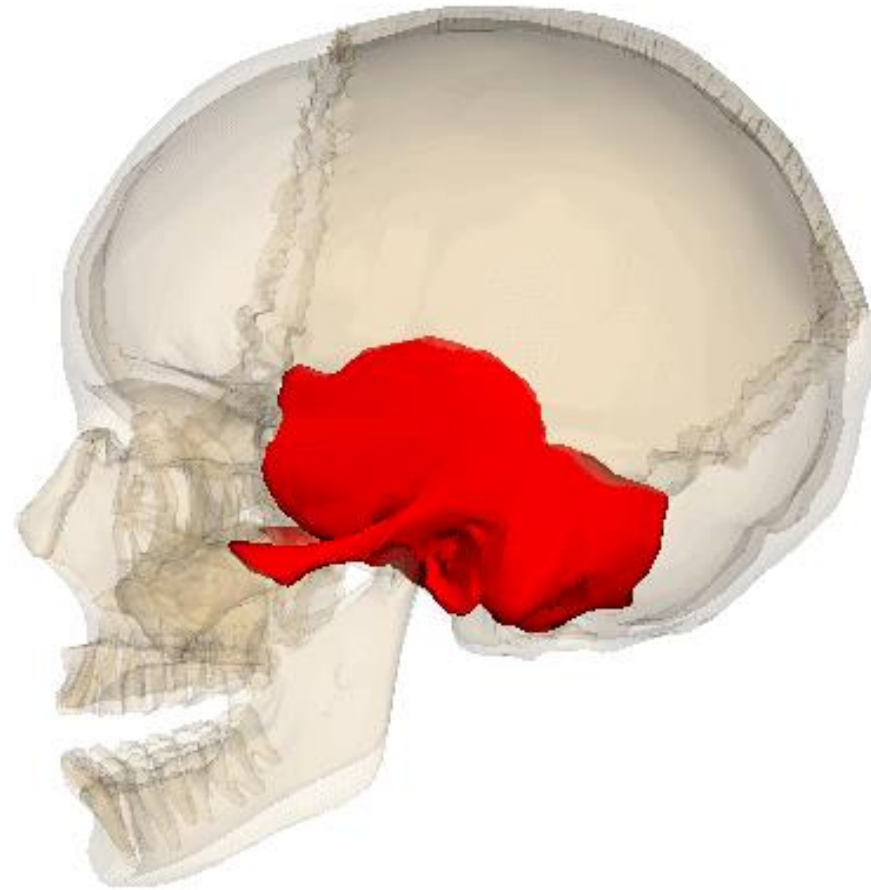


P. P. Rubens: *Virgin in Adoration before the Christ Child*



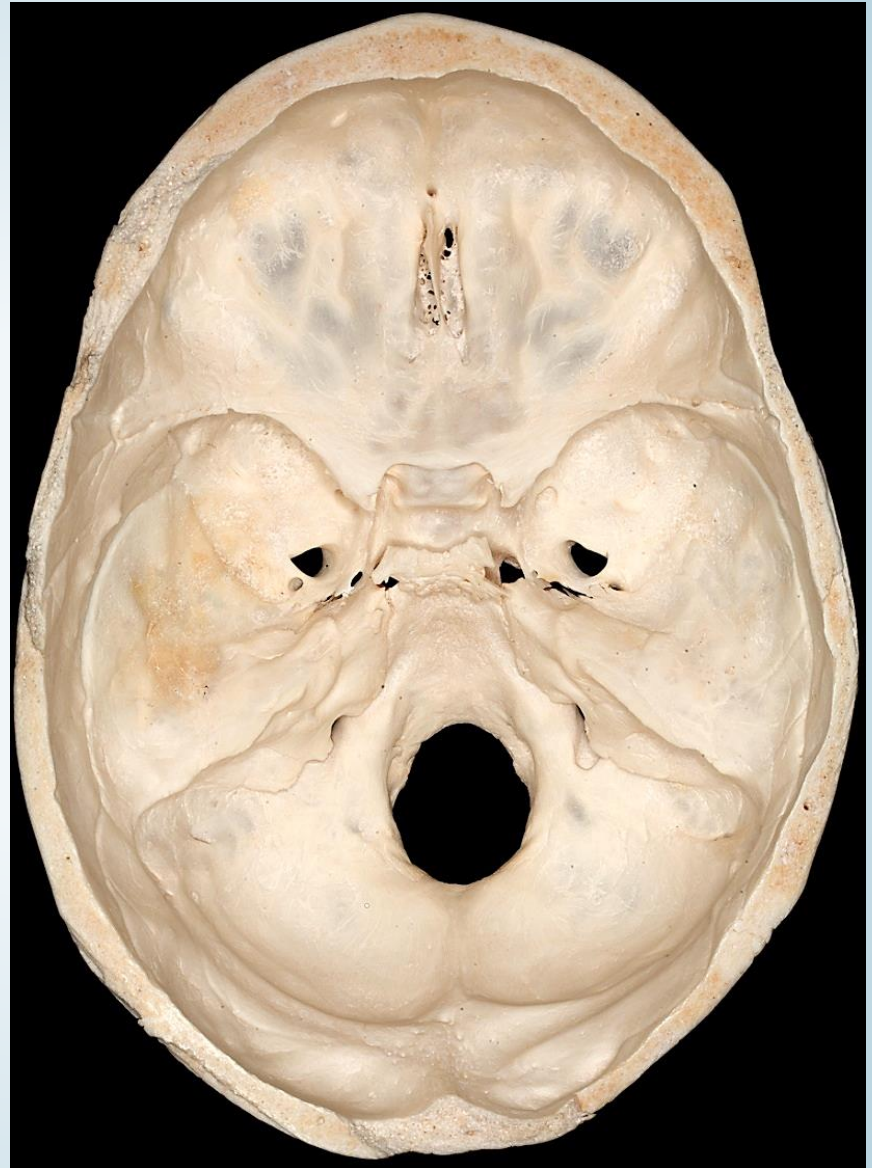
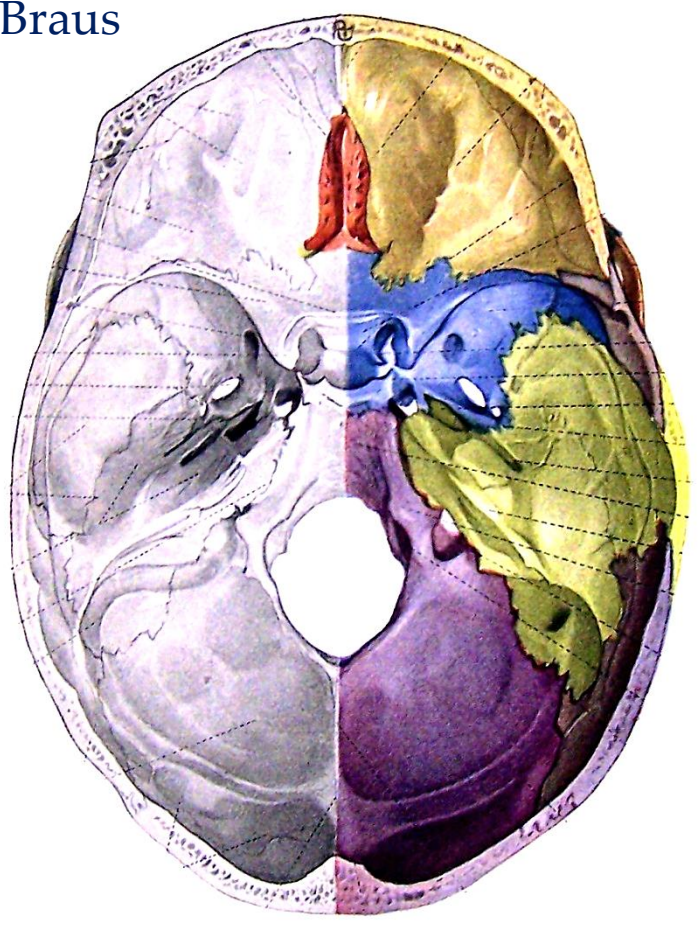


Braus





Braus



Among:

Os sphenoidale

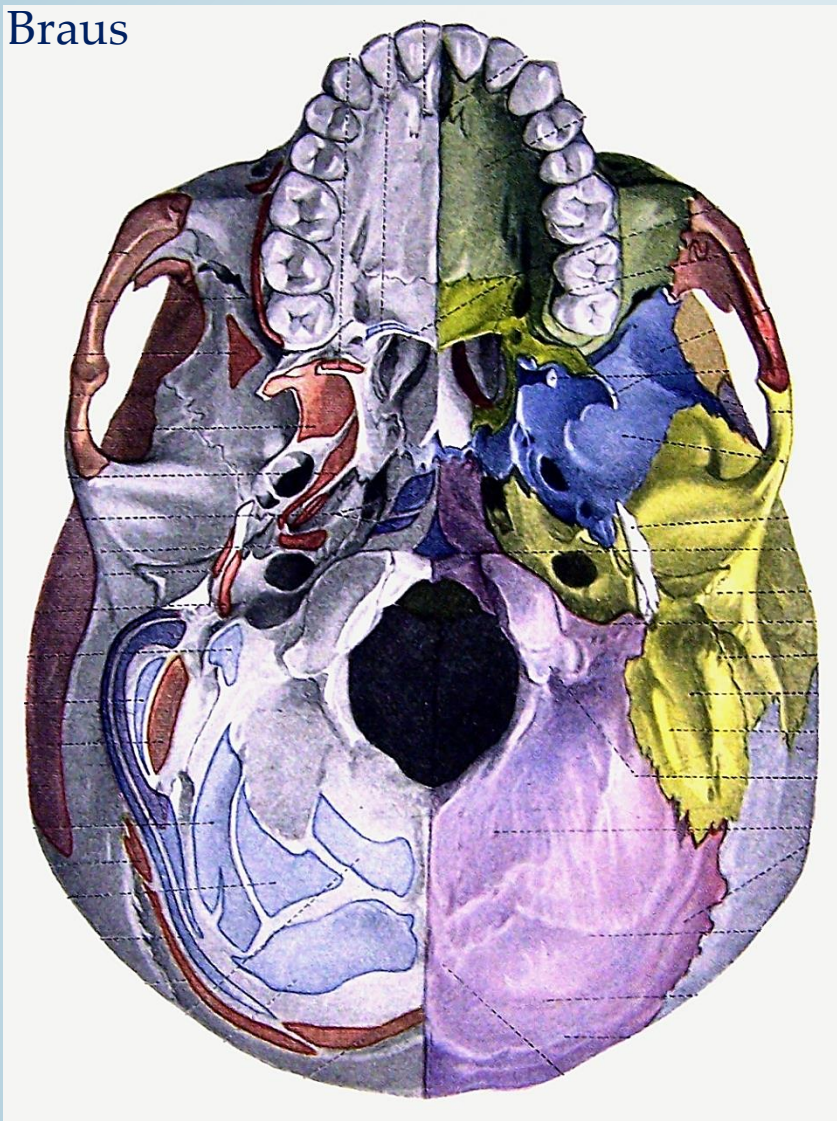
Os parietale

Os occipitale

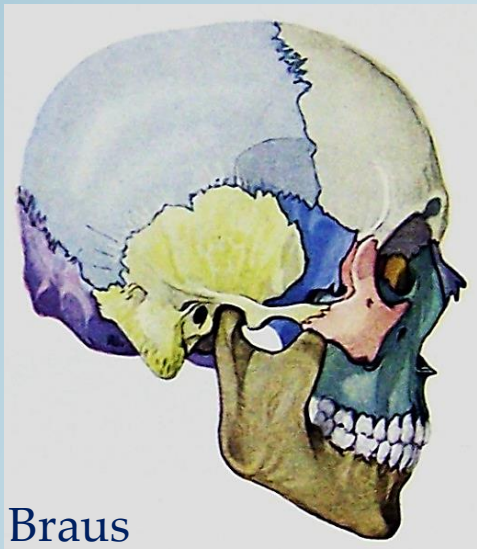
Os zygomaticum



Braus





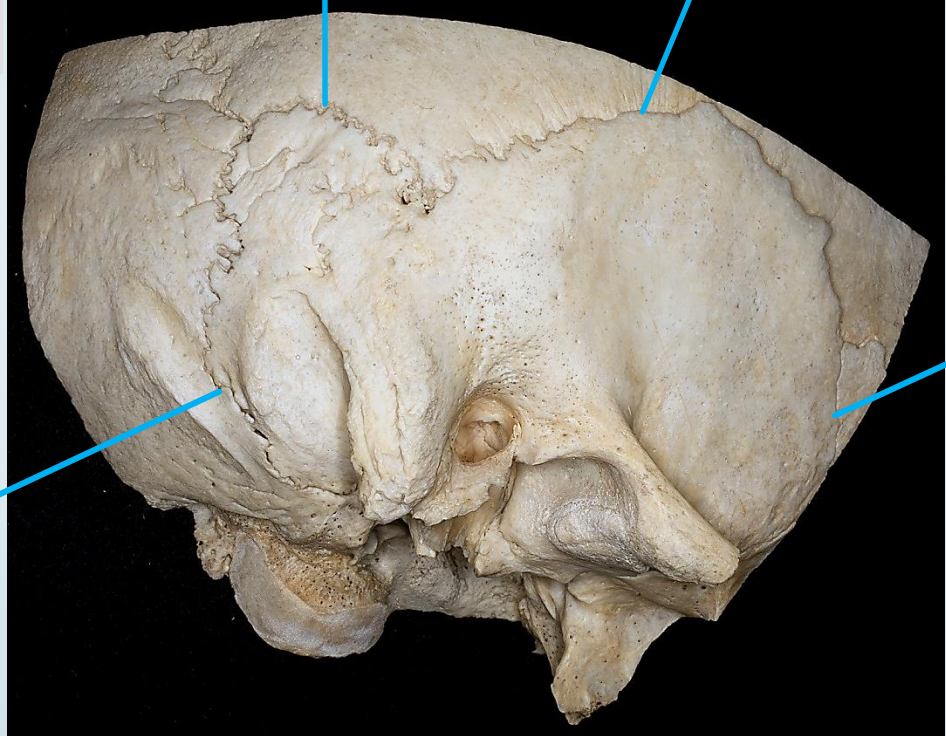


Braus

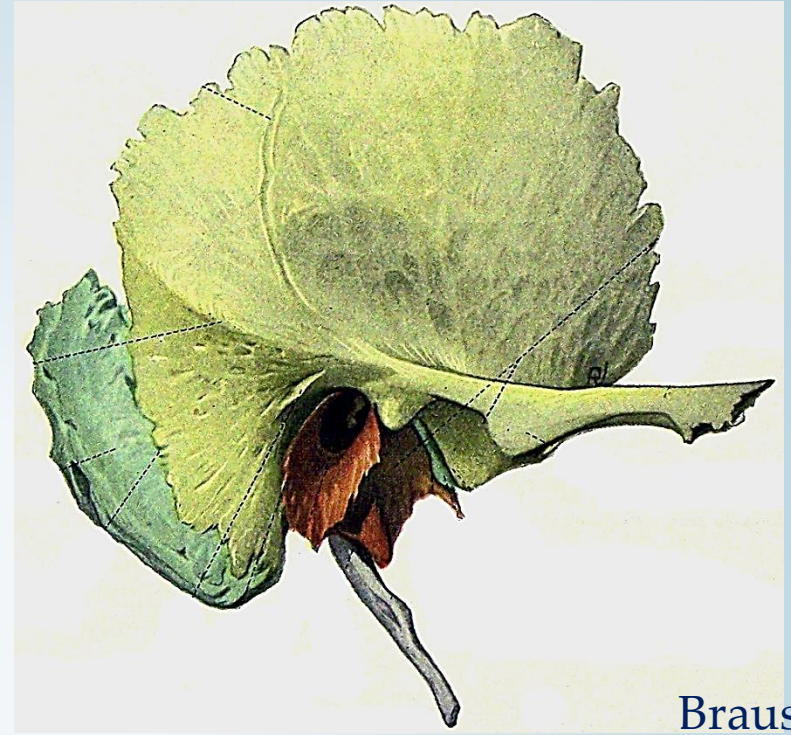
Sutura Parietomastoidea

Sutura squamosa

Sutura Occipito-mastoidea



Sutura sphenosquamosa

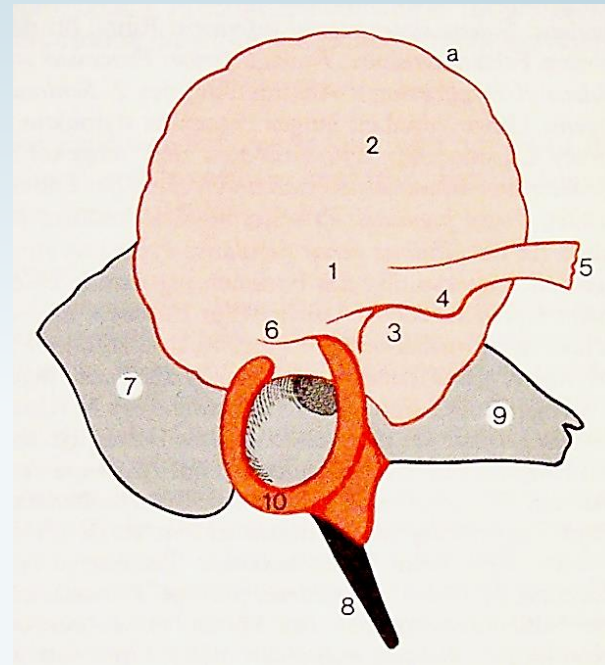


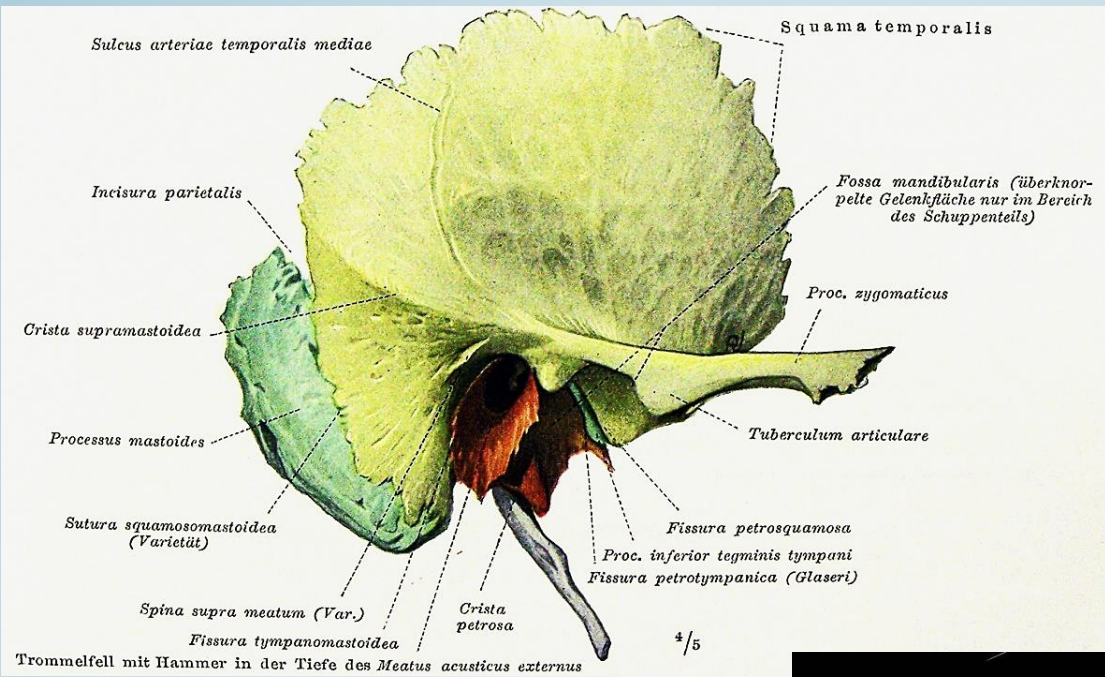
Braus



Pars Squamosa  
Pars *Mastoidea*  
Pars Tympanica  
Pars Petrosa  
Pars Hyoidea







# Aspectus lateralis





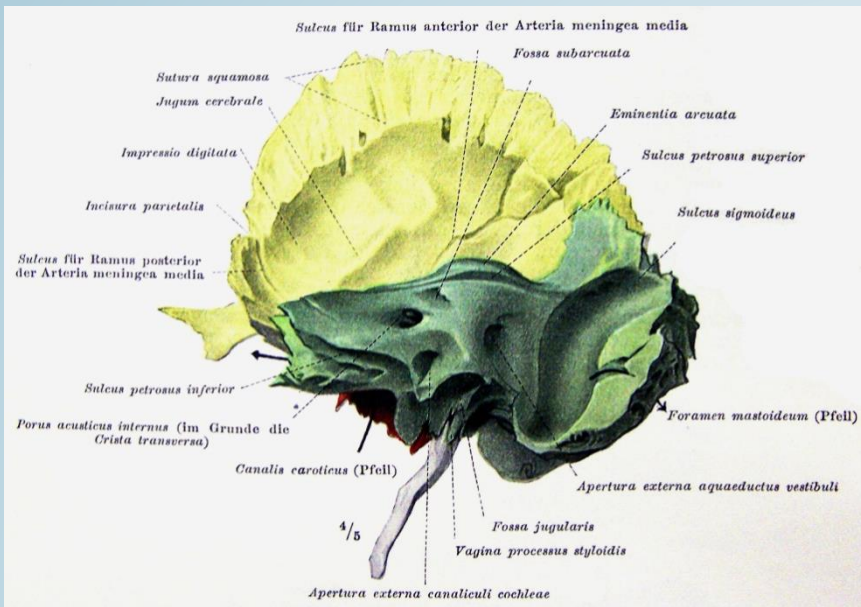
Mastoid-air cells



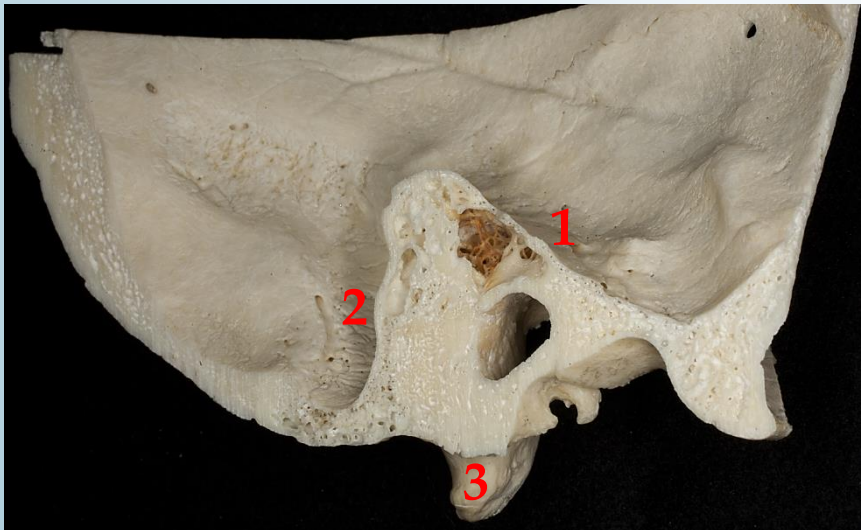
Antrum and Aditus



# Aspectus posterior



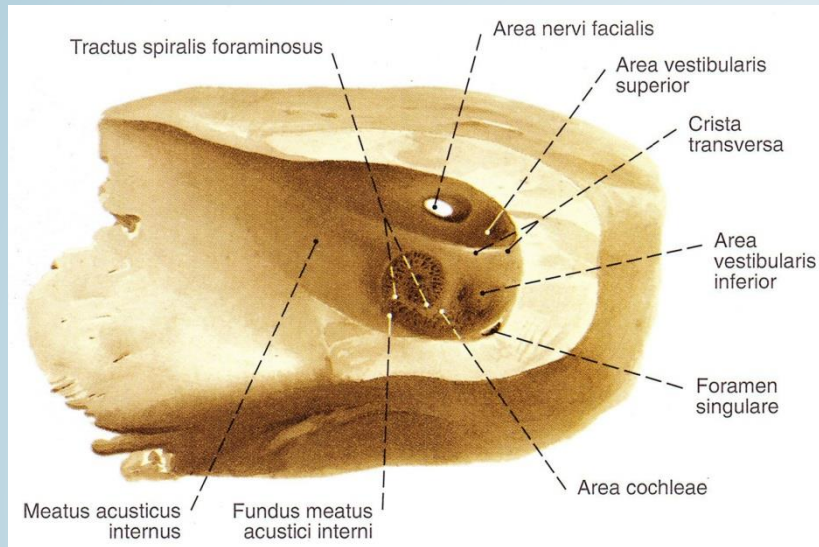
## Braus



- Pyramid: 3 surfaces
1. anterior pyramidal
  2. posterior pyramidal
  3. inferior pyramidal



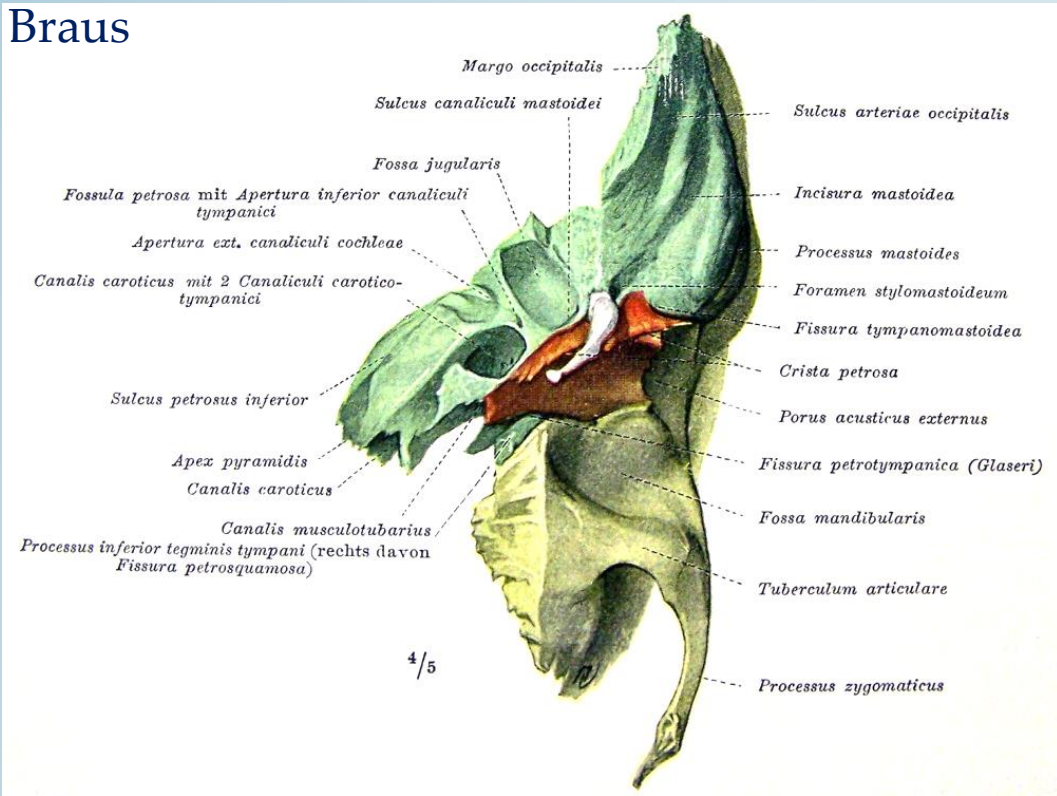
# Sobotta



4 quadranten:  
Area facialis  
Area vestibularis superior  
Area vestibularis inferior und  
singulate foramen  
Area cochlearis

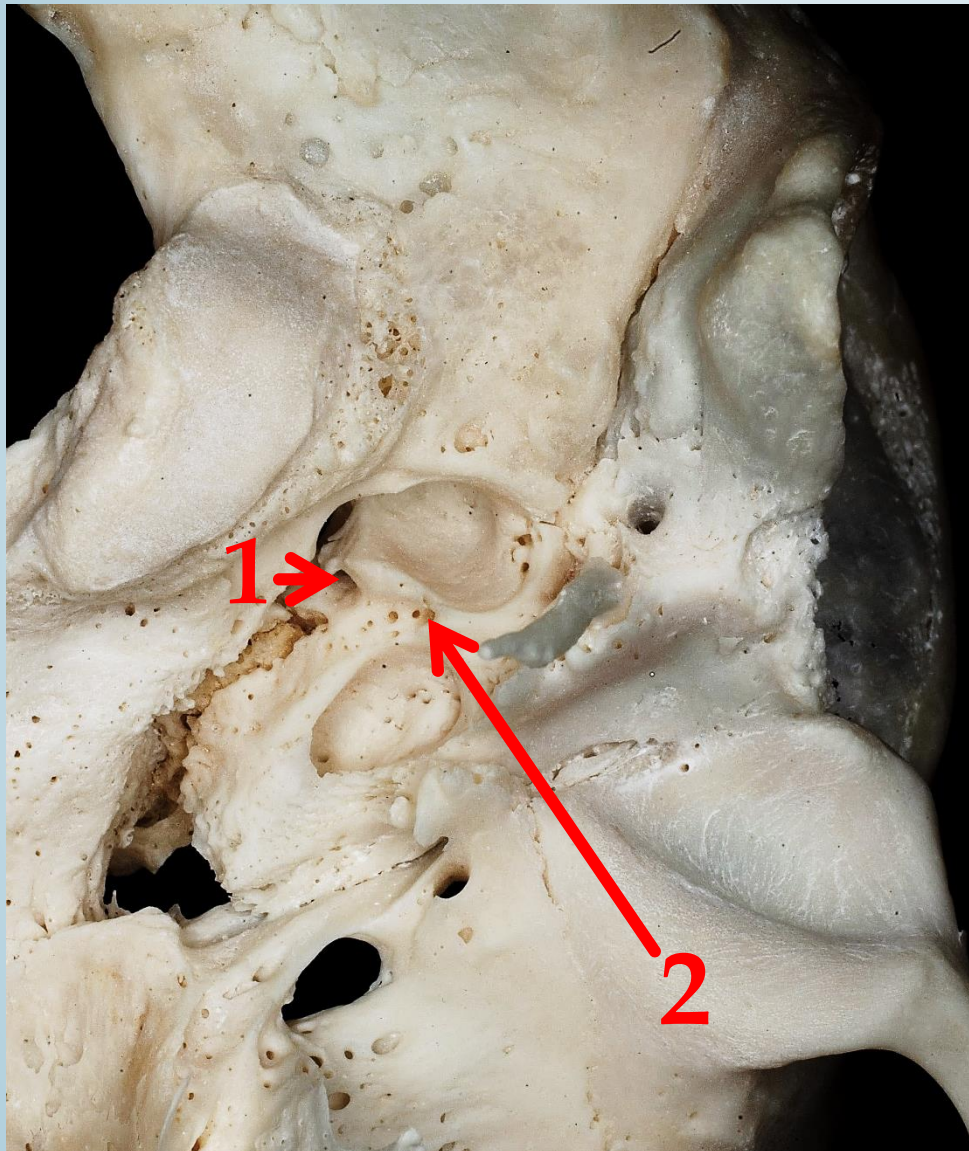


# Braus

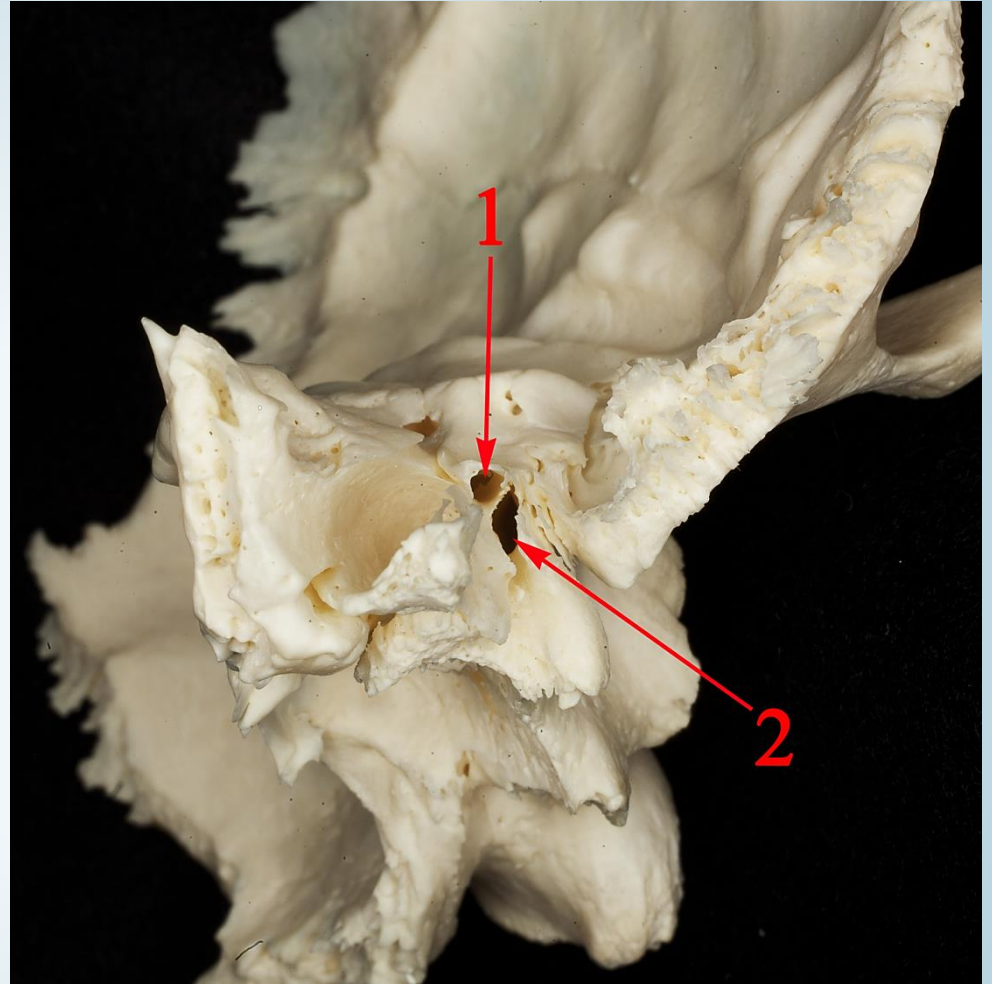


## Aspectus inferior





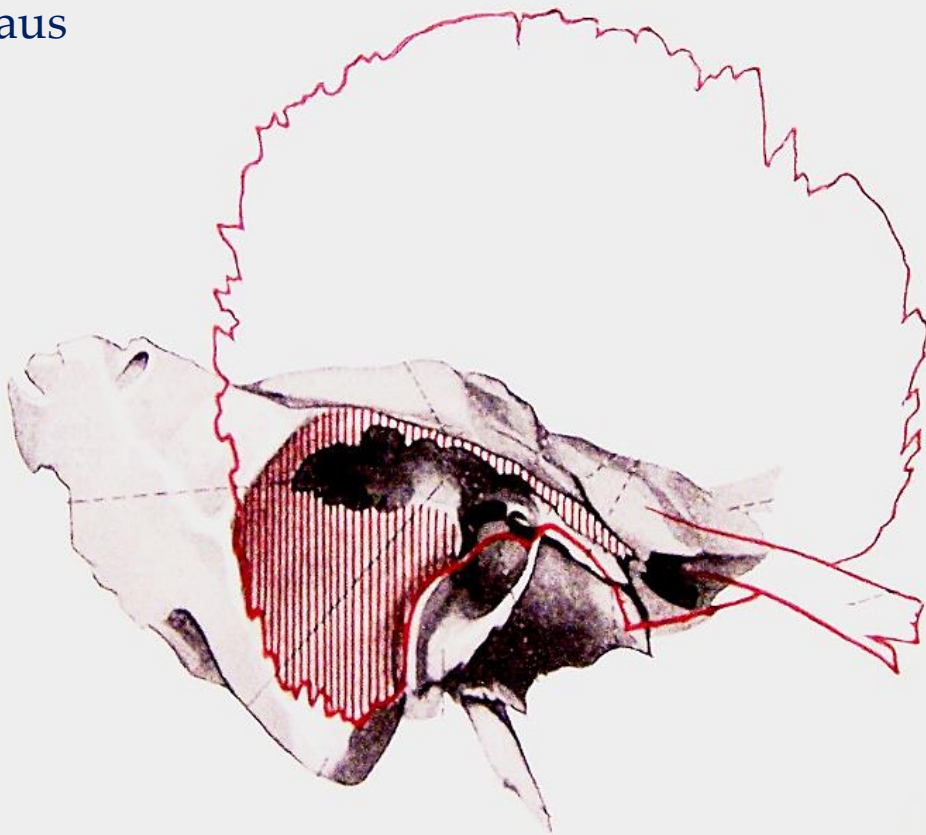
1. canaliculi cochleae  
(medial to the petrosal fossa, between the jugular foramen and the carotid canal)
2. Fossula petrosa and tympanic canaliculus (laterally from the former, also between two vascular openings)



Canalis Musculotubarius = semicanalis m. tensor tympani (1) + semicanal tubae auditivae (2)



Braus



4 / 5

## Tegmen tympani

1. Fissura Petrotympánica  
(*Glaserian fissure*)  
(Chorda tympani ???)

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ANNALS  
OF ANATOMY  
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### Development of the anterior chordal canal

Miklós Tóth<sup>a,\*</sup>, Gerhard Moser<sup>b</sup>, Lajos Patonay<sup>c</sup>, Imre Oláh<sup>a</sup>

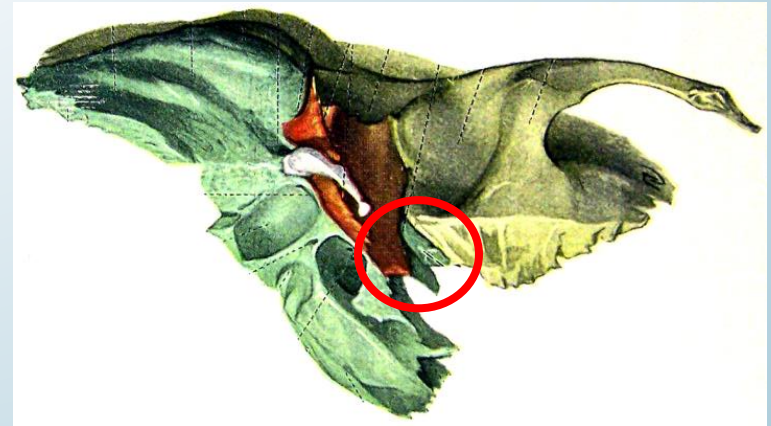
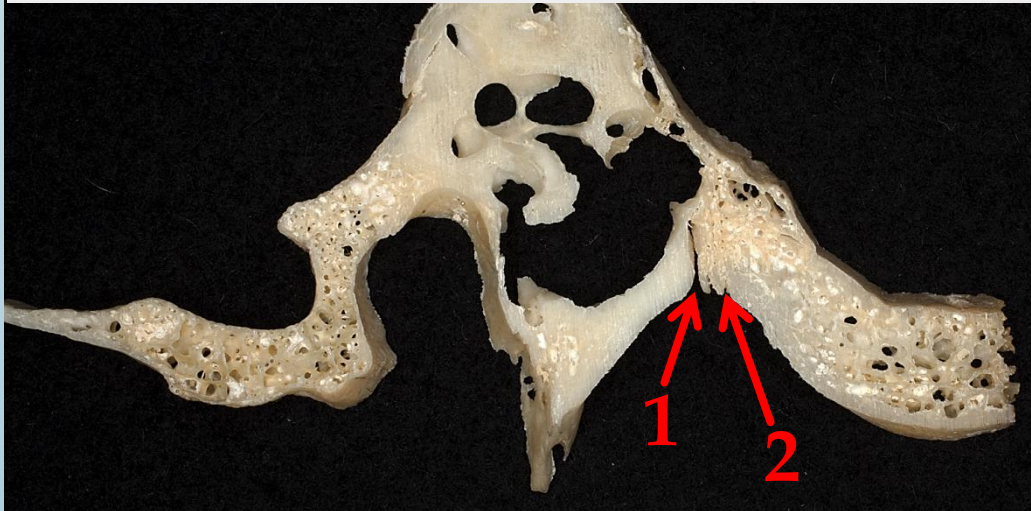
<sup>a</sup>Department of Human Morphology and Developmental Biology, Faculty of Medicine, Semmelweis University, Tűzoltó utca 58, H-1094 Budapest, Hungary

<sup>b</sup>Department of Otorhinolaryngology, Salzburg University Medical School, Salzburg, Austria

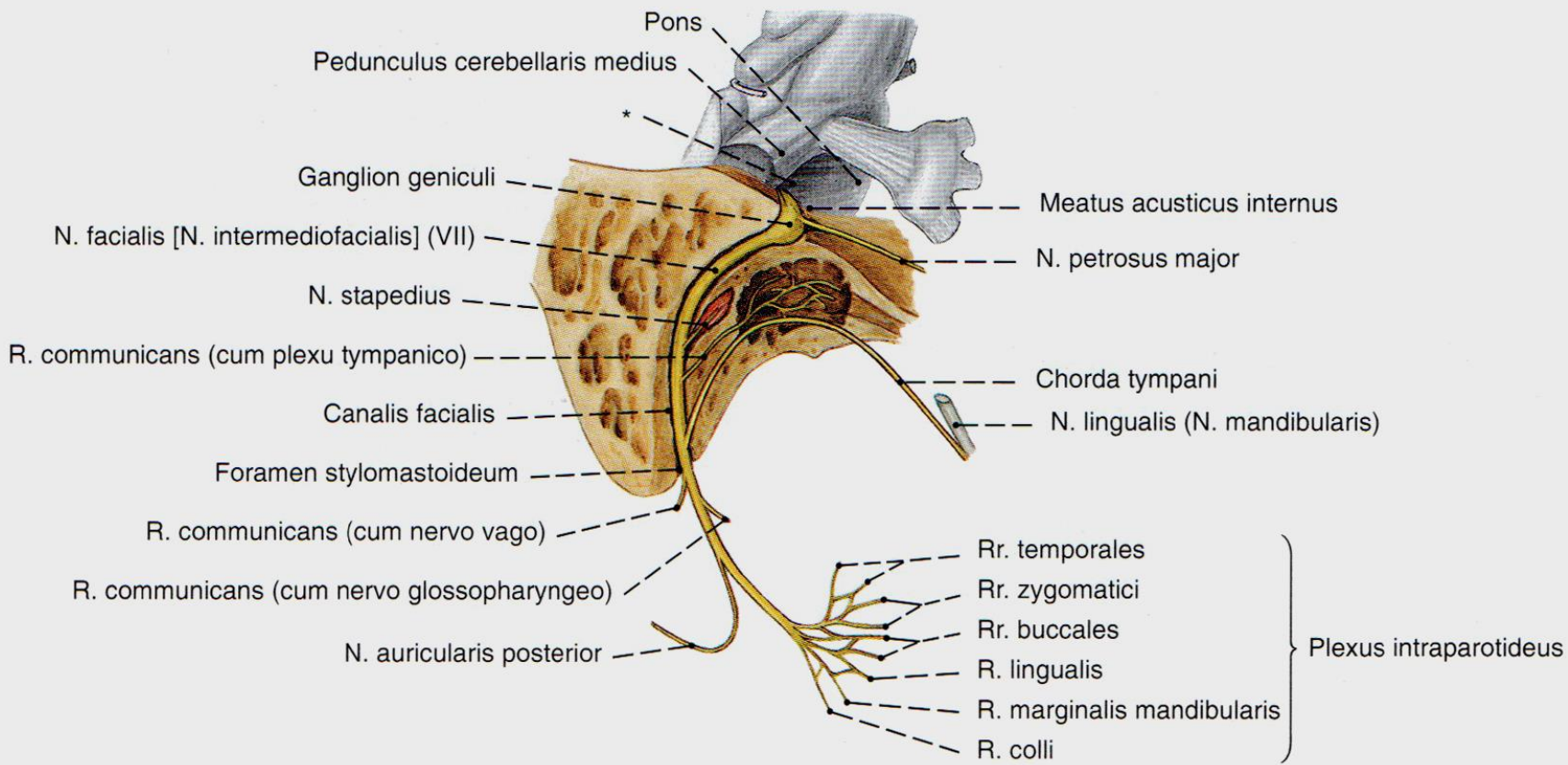
<sup>c</sup>Department of Anatomy, Histology and Embryology, Faculty of Medicine, Semmelweis University, Tűzoltó utca 58, H-1094 Budapest, Hungary

Received 25 January 2005; accepted 5 April 2005

## 2. Fissura Petrosquamosa

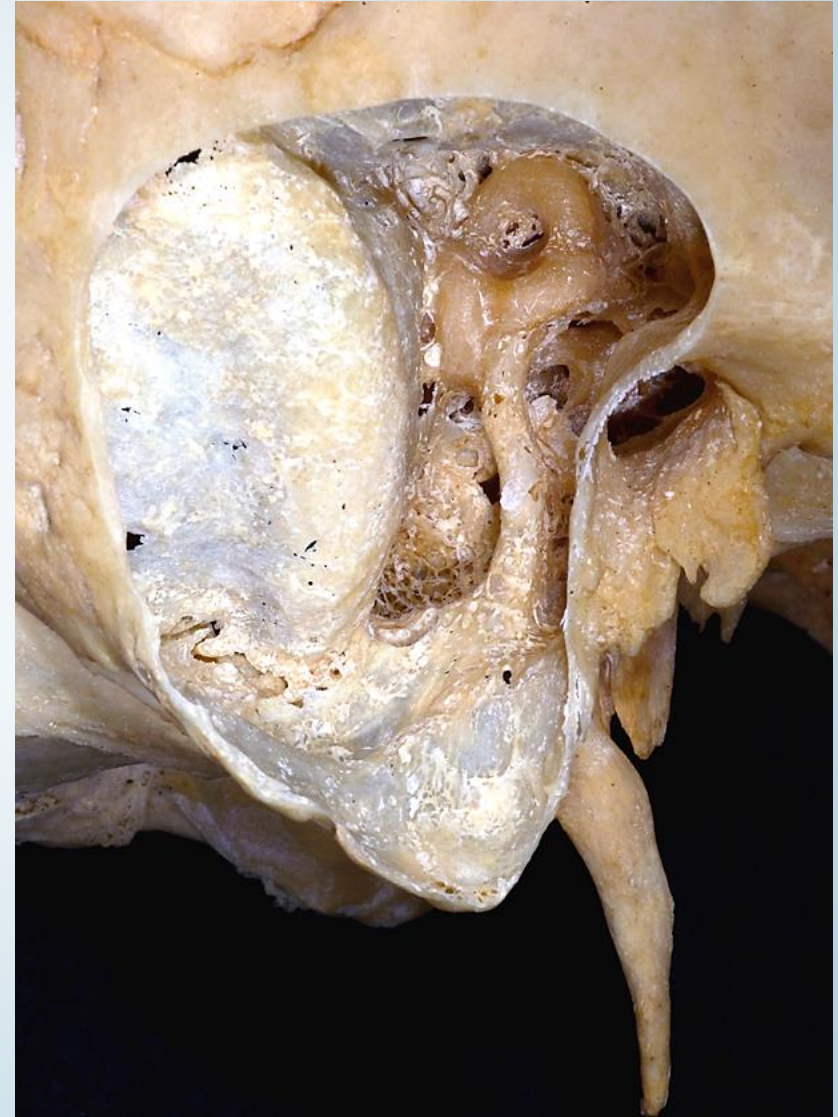


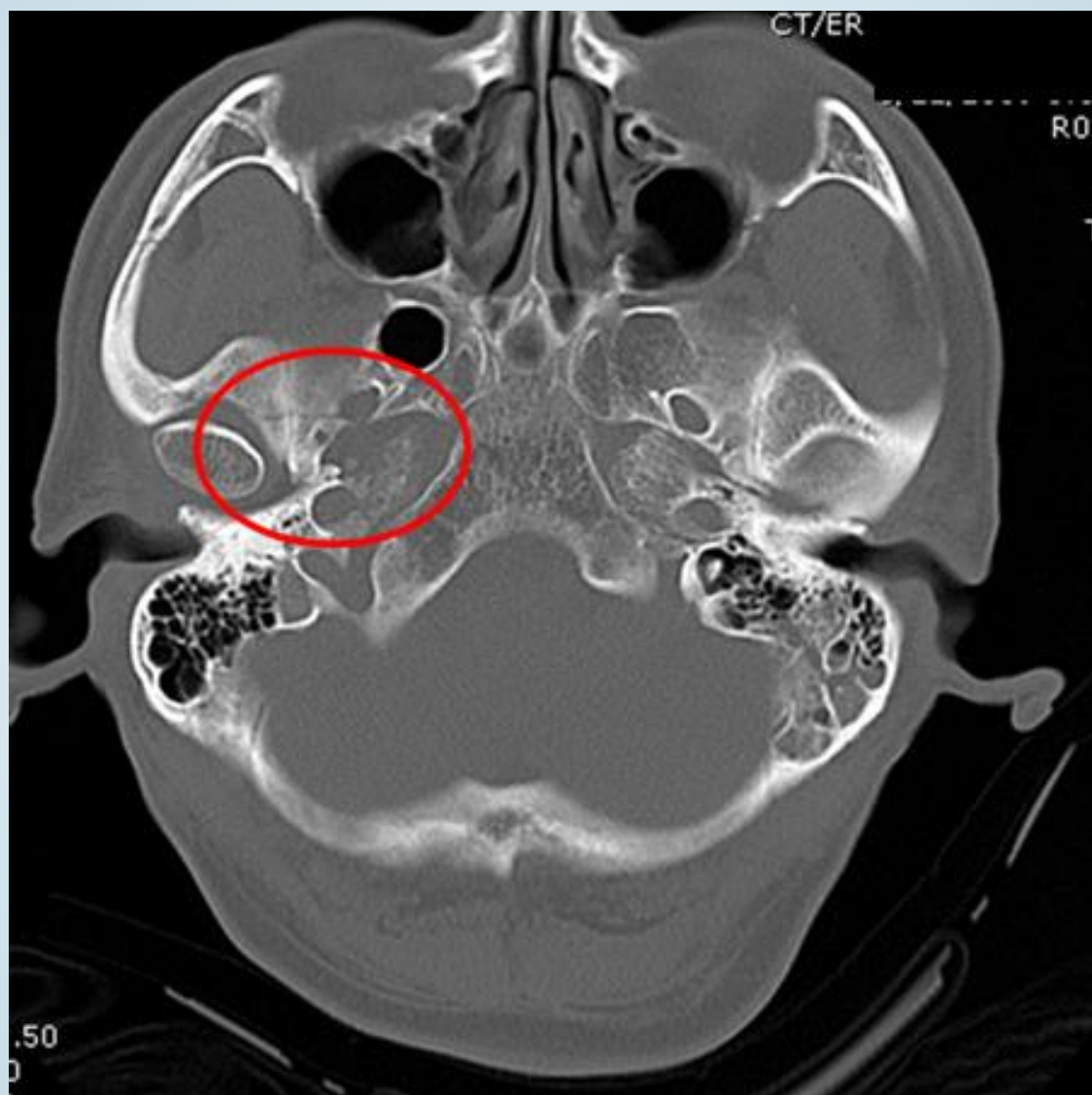
# Facial canal (Fallopian canal)





## Facial canal (Fallopian canal)







# Literature

Braus Anatomie des Menschen Band I (Verlag von Julius Springer 1929.)

Faller: Anatomie in Stichworten: Ein Arbeitsbuch für Medizinstudenten und praktische Ärzte (Ferdinand Enke Verlag 1988.)

Sobotta: Az ember anatómiájának atlasza (Urban & Fischer 2000.)

Thumfart: Operative Zugangswege in der HNO-Heilkunde (Thieme 1998.)