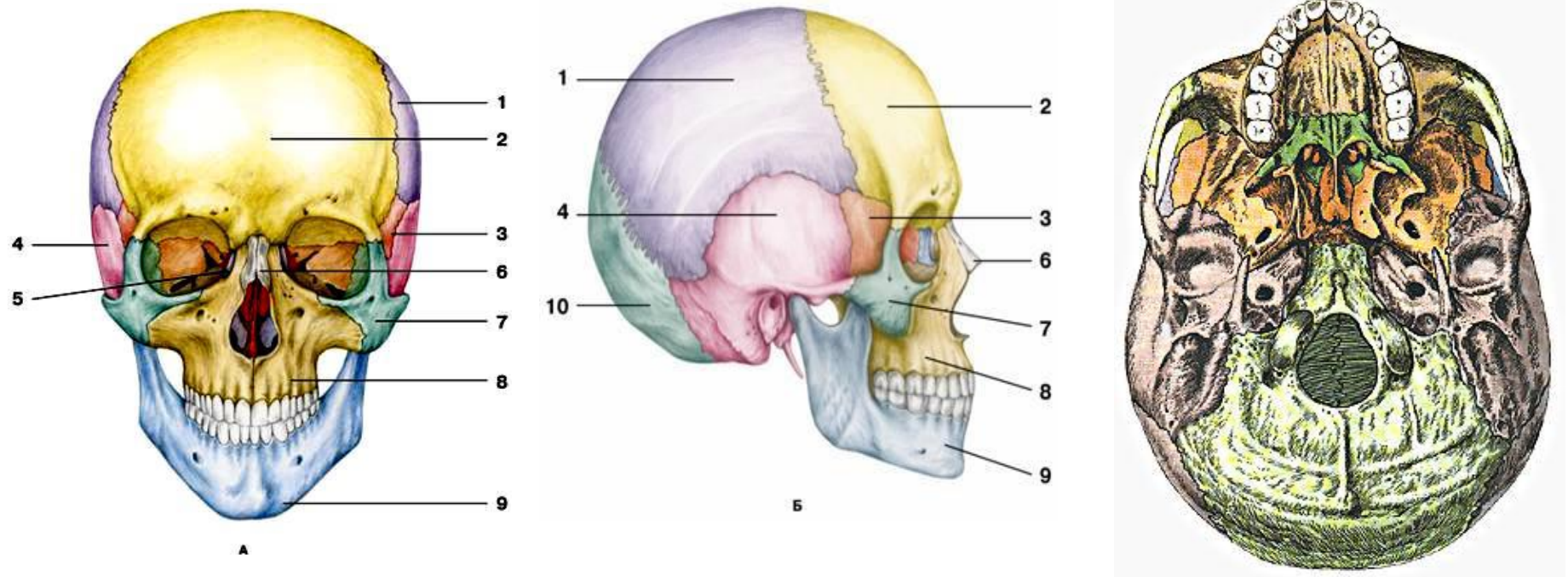


# FUNCTIONAL ANATOMY OF THE SKULL

1. Divisions of the skull
2. Peculiarities of the skull bones
3. Variability of the skull
4. Development of the skull
5. Anomalies of the skull
6. Examination of the skull on a living person

*Lecturer: PhD, professor Tamara Hacina*



The skull is formed by **22 bones**: *1 movable*, *21 immovable*. The skeleton of the head includes **8 paired bones** (nasal, lacrimal, maxilla, zygomatic, inferior nasal concha, palatine, temporal, parietal) and **6 unpaired bones** (frontal, occipital, sphenoid, ethmoid, mandible, vomer).

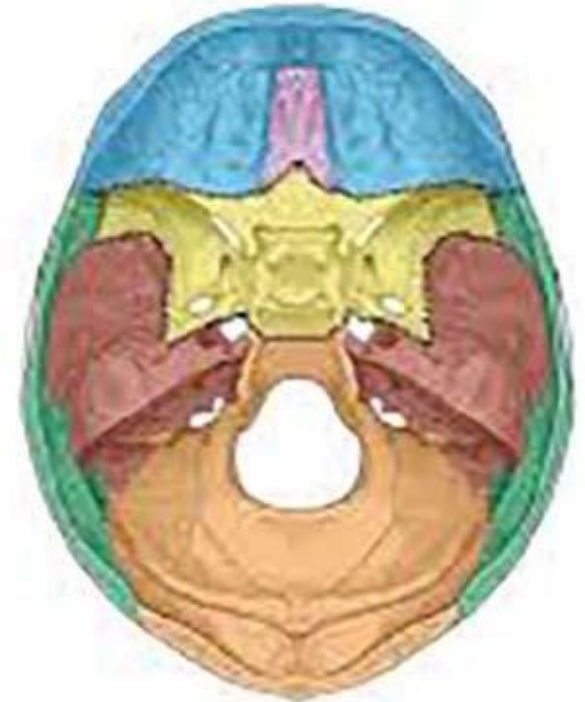
# Divisions of the skull

Two divisions of the skull are distinguished:

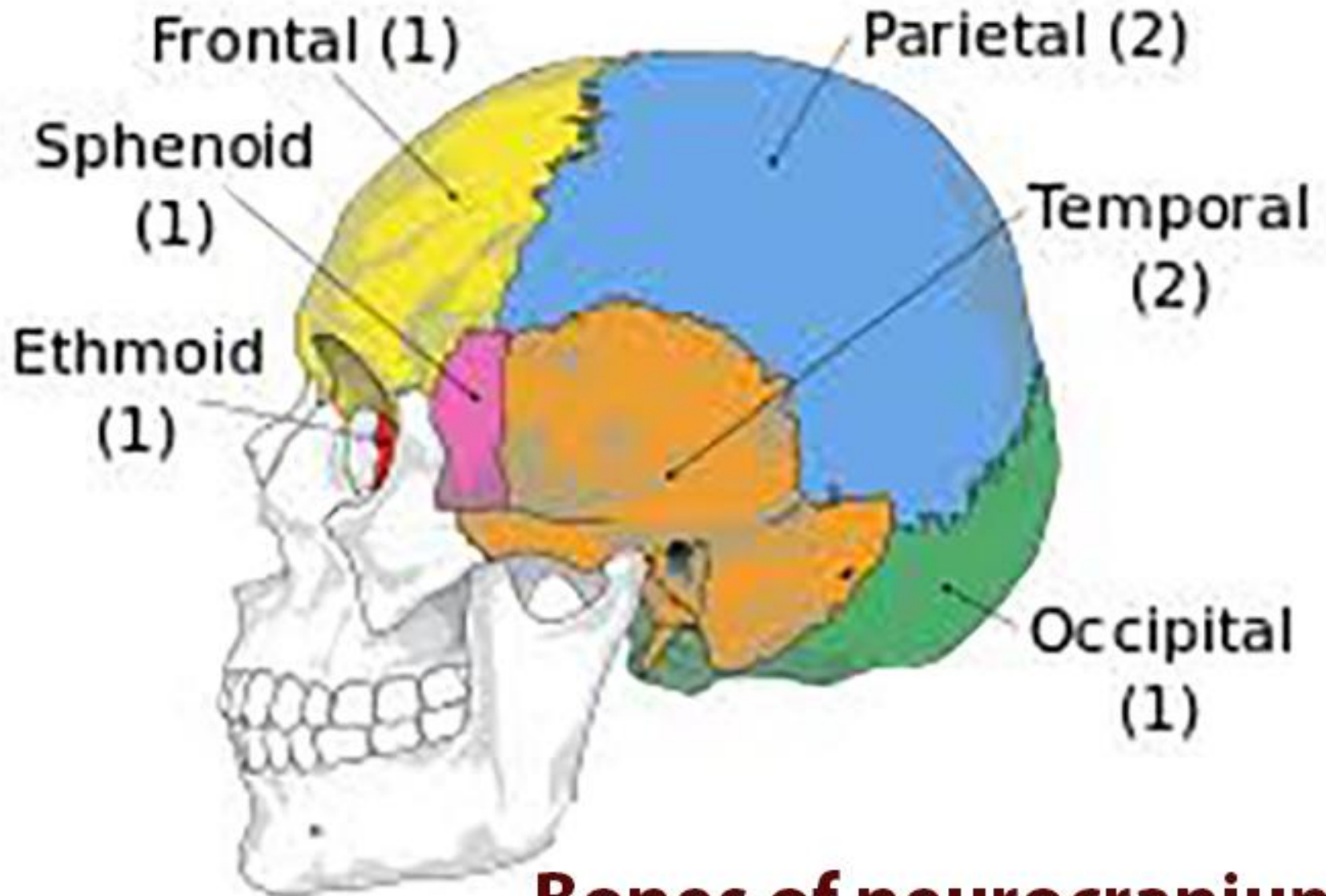
1) **Viscerocranium** or **splanchnocranium**, or **facial skull**. This part of the skull protects the sense organs (visual, taste, smell) and initial divisions of the respiratory way and digestive tract.

2) **Neurocranium** or **cerebral skull**, or neuroskull is **composed** of the bones participating in the conformation of the cranio-encephalic cavity, protection of the brain, auditory and vestibular organs.

- The superior part of the cerebral skull is called the cranial **vault** or **calvaria** (*calvaria*, PNA);
- The inferior part is the **base of the skull** (*basis crania*, PNA).



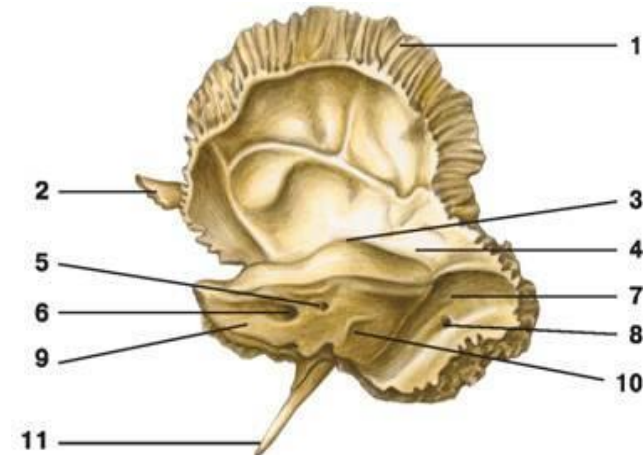
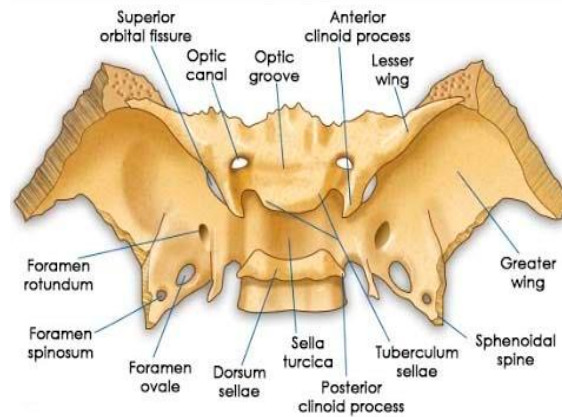
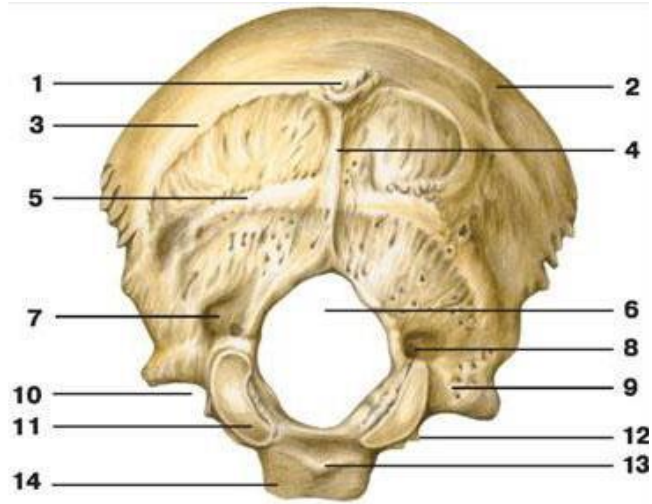
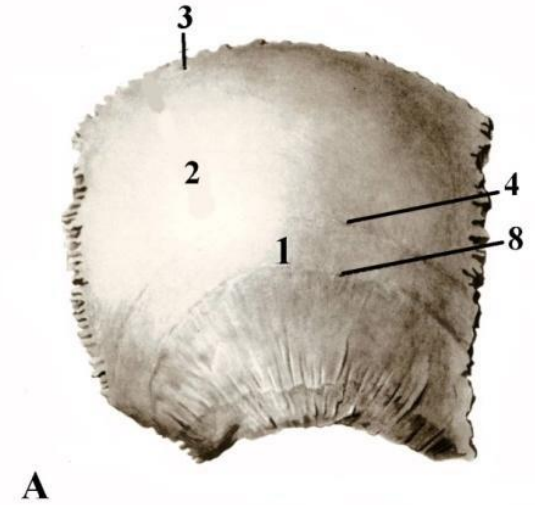
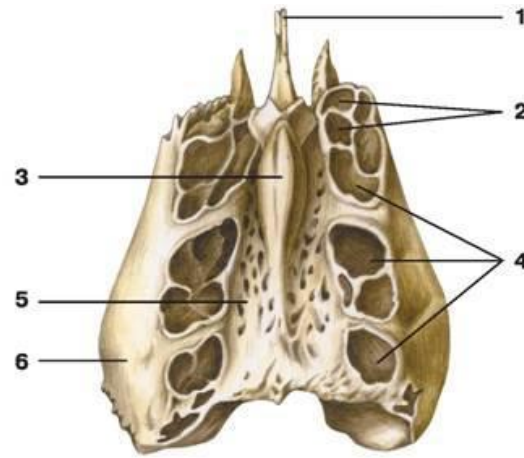
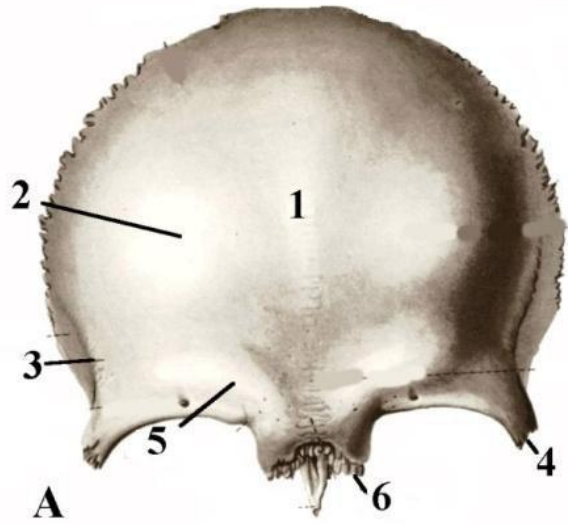
# Bones of the skull

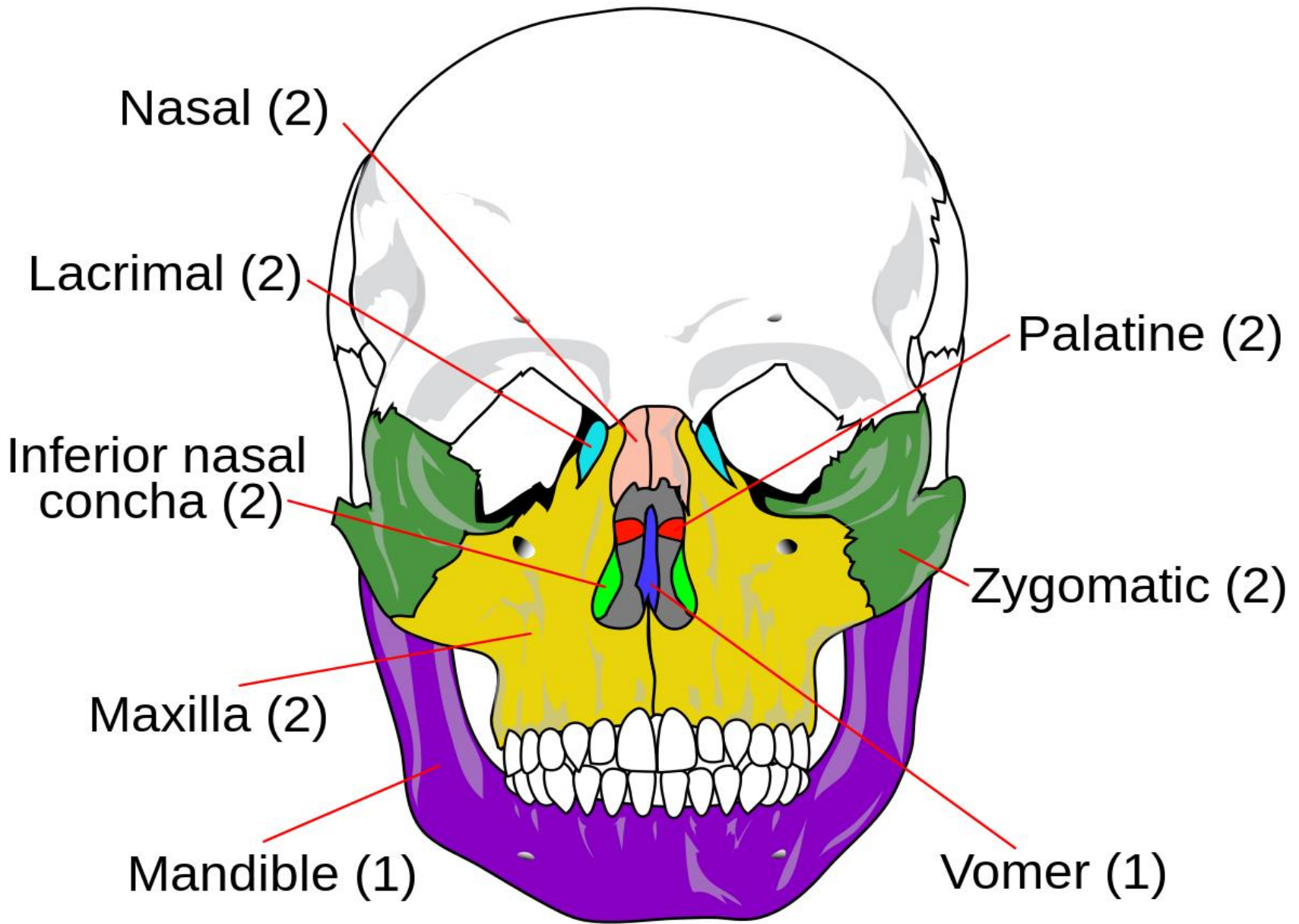


**Bones of neurocranium**



# Bones of the cerebral skull

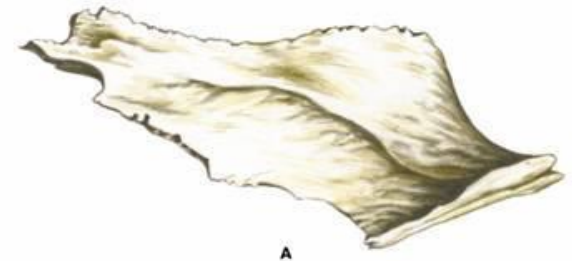
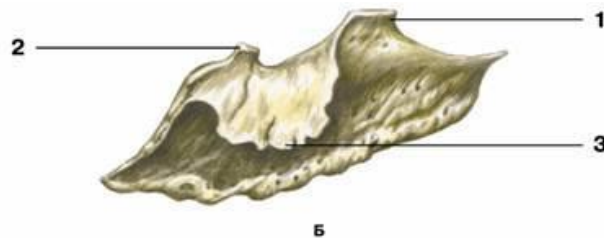
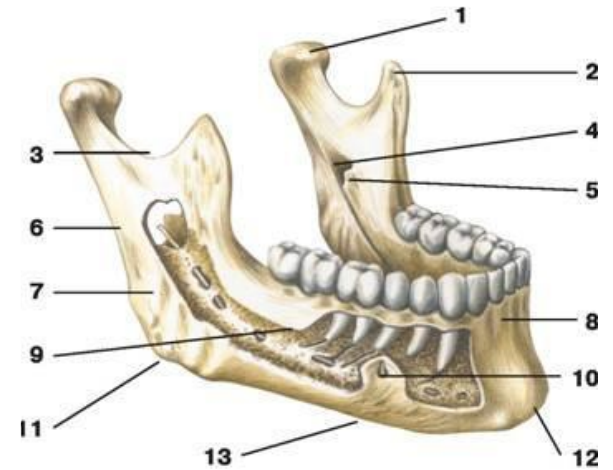
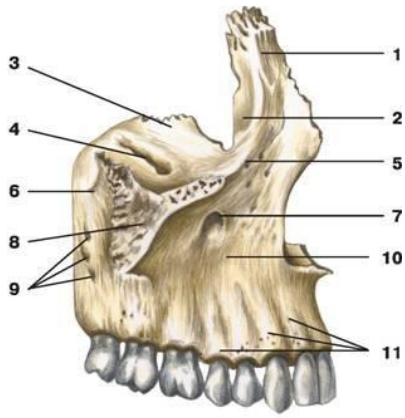




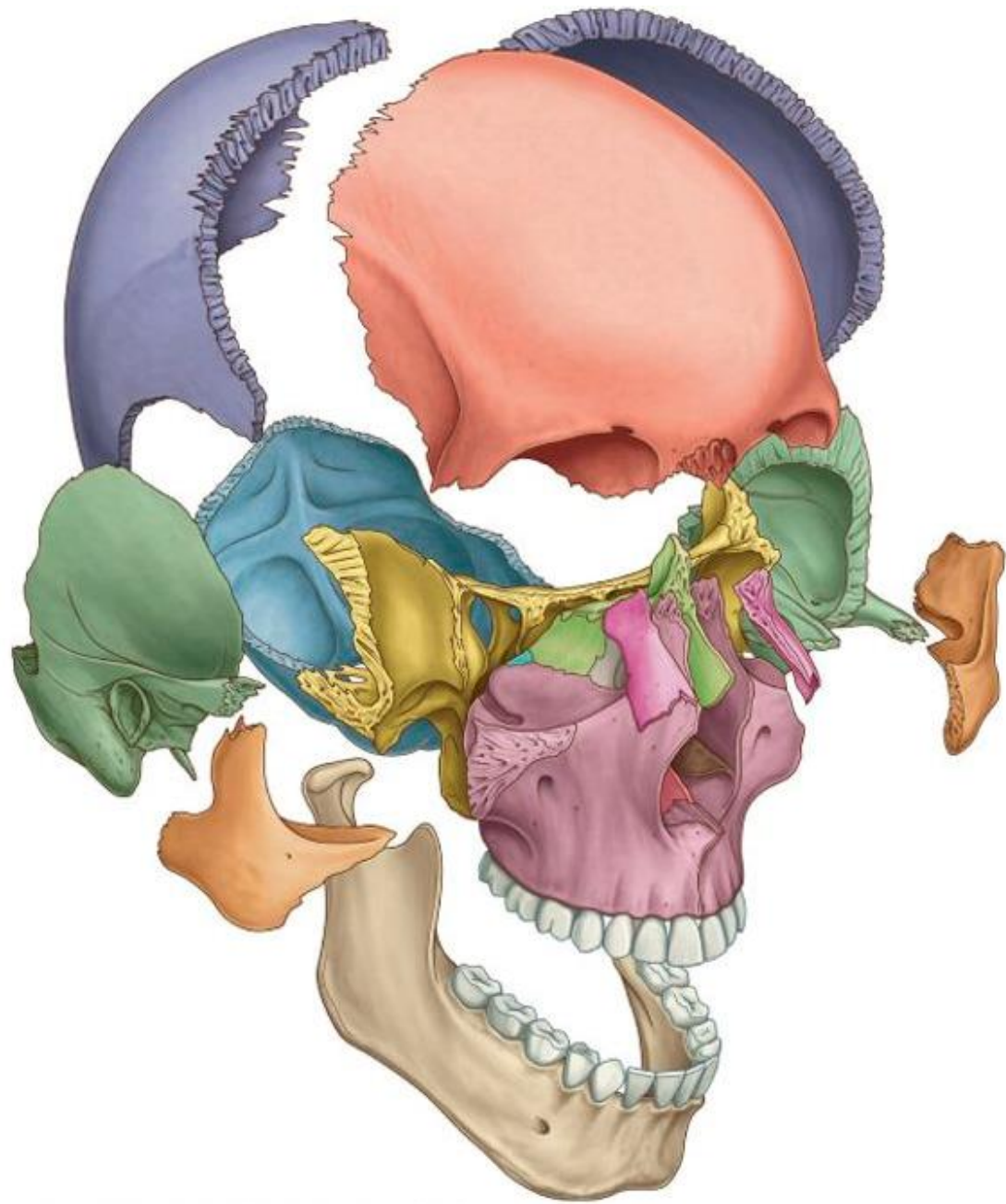
# 14 Facial Bones

# Bones of the visceroskull

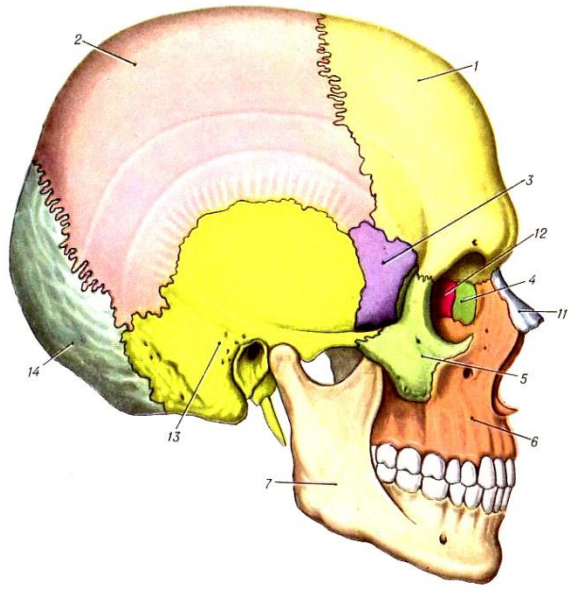
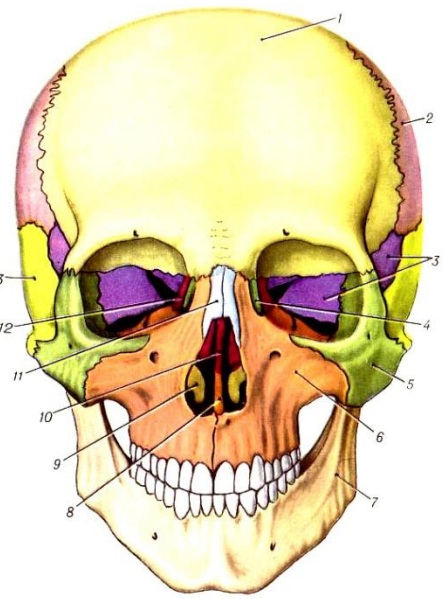
- 2 unpaired bones: vomer, mandible
- Paired bones: maxilla, zygomaticul, nazal, lacrimal, palatine, inferior nasal concha.
- Bones of the visceral skull form *orbits*, *nasal* and *oral cavities*











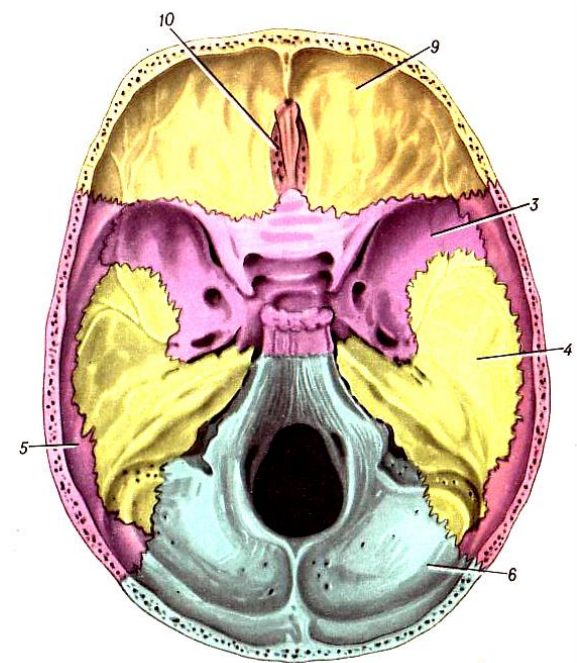
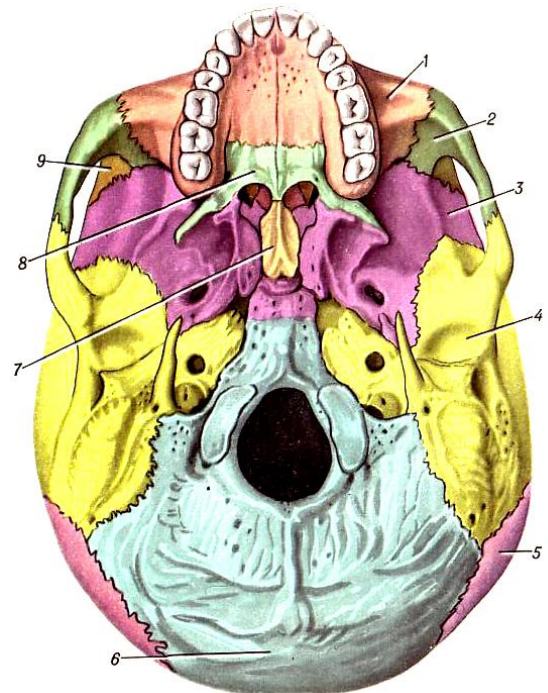
**Cerebral skull  
= neurocranium**

- Frontal bone**
- 2 parietal bones**
- 2 temporal bones**
- Occipital bone**
- Sphenoid bone**
- Ethmoid bone**

**Facial skull**

- 2 nasal bones**
- 2 lacrimal bones**
- 2 maxillae**
- 2 zygomatic bones**
- 2 lower nasal conchae**
- 2 palatine bones**
- Vomer**
- Mandible**

*Hyoid bone – region of the neck*



# Significance of the base of the skull

- *forms the floor of the cranial cavity supporting the brain;*
- *fixes the skeleton of the face and delimitates some common craniofacial topographic territories;*
- *participates in the formation of craniovertebral joints;*
- *its numerous channels and holes represent a vast passage between the cranial cavity and the underlying topographic regions for the cranial nerves and blood vessels.*

# Peculiarities of the skull bones

Complex structure: they consist of some parts.

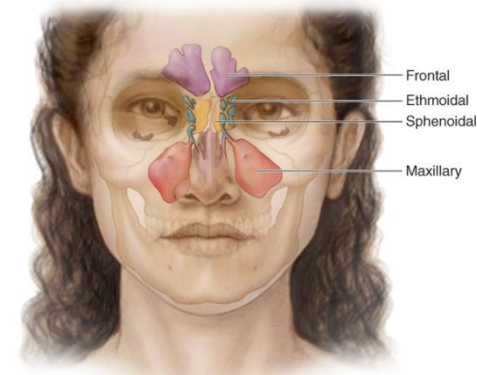
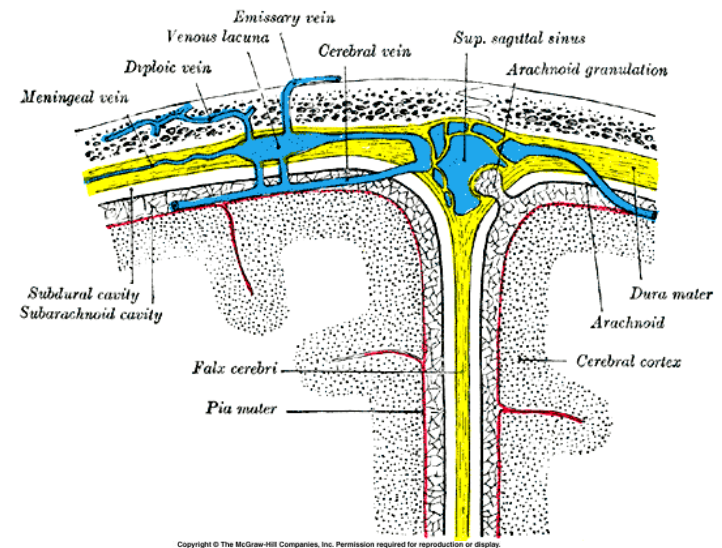
They are composed of 2 lamellae of compact bony tissue (external lamina – hard and resistant; internal – rich in mineral salts, fragile). The soft spongy material (diploe) between the inside table and outside table (the interior and exterior bony plates) of the skull. The diploe contains bone marrow and diploic veins.

Existence of foramina for the emissary veins diploic veins. The emissary veins are veins which normally drain external veins of the skull into the dural venous sinuses.

Some skull bones contain air cavity.

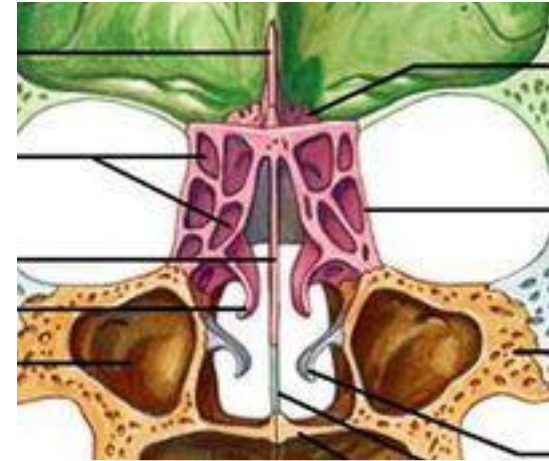
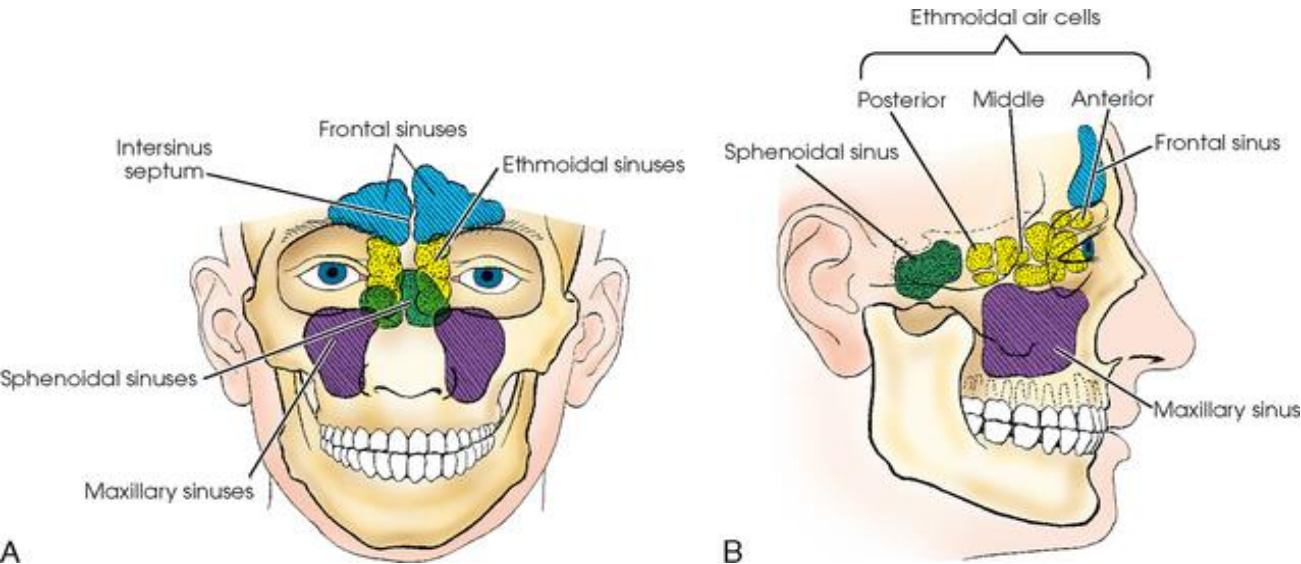
The pillars of resistance (regions of compact bone which transmit mastication power to the calvaria and base of the skull).

Thickness of the skull-cup bones is variable, minimum in the sinuses (about 2 - 6 mm) and maximum (10-15 mm) - at the level of the internal occipital protuberance.





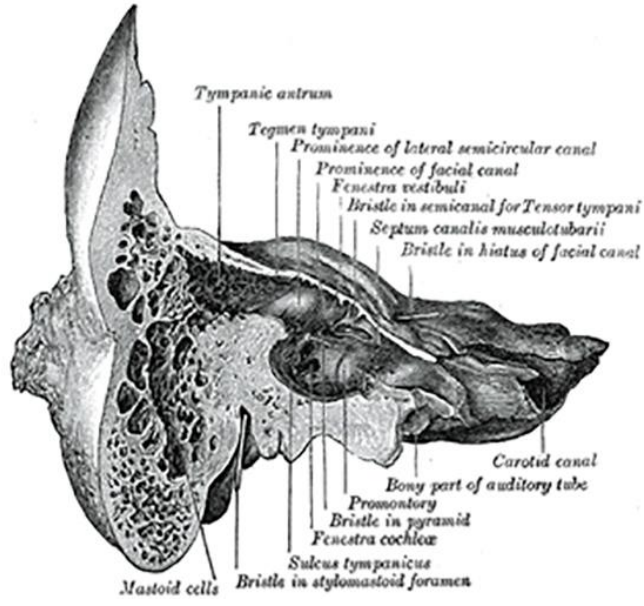
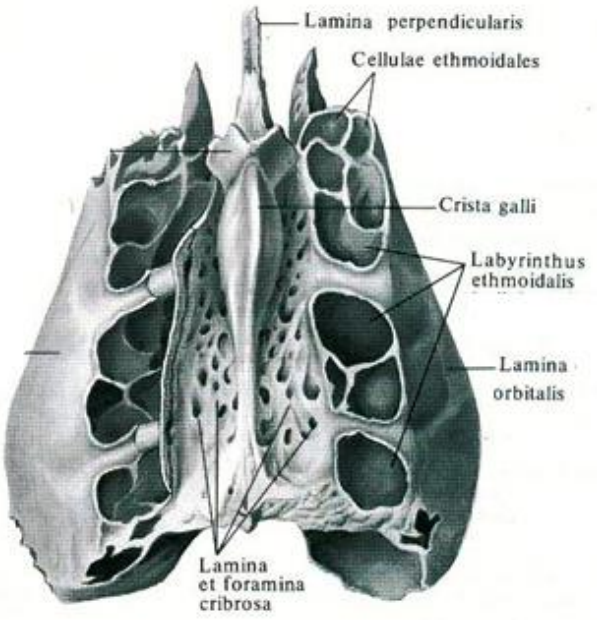
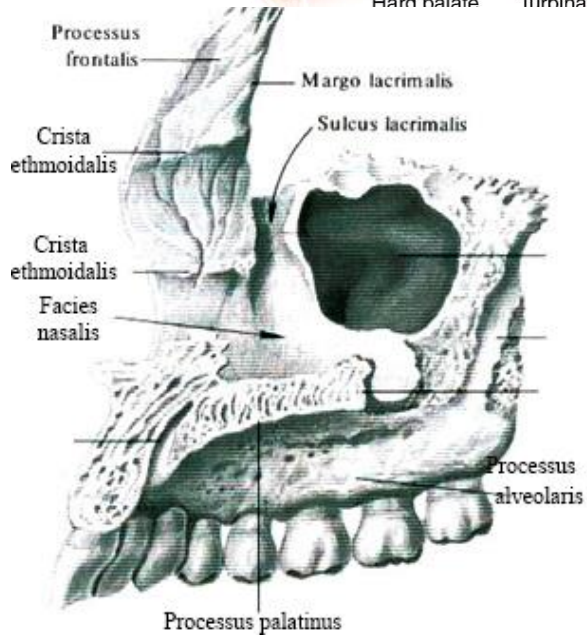
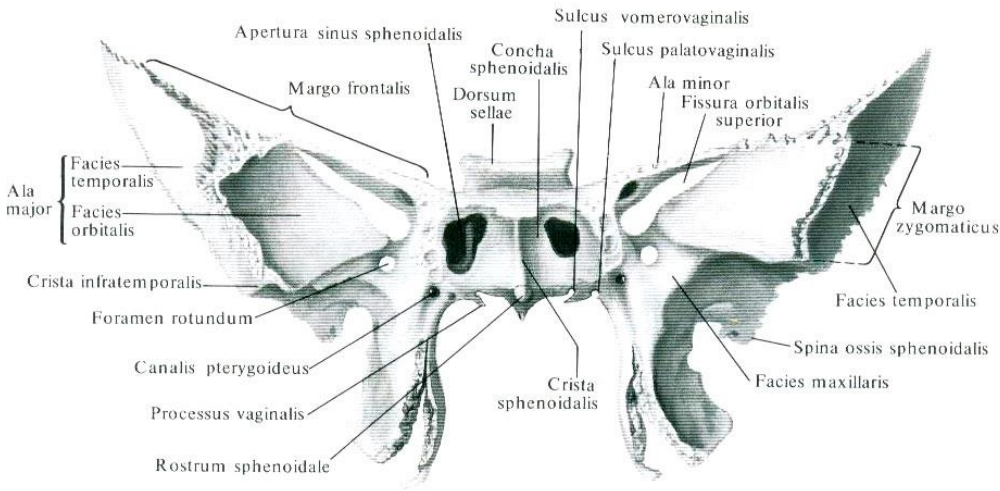
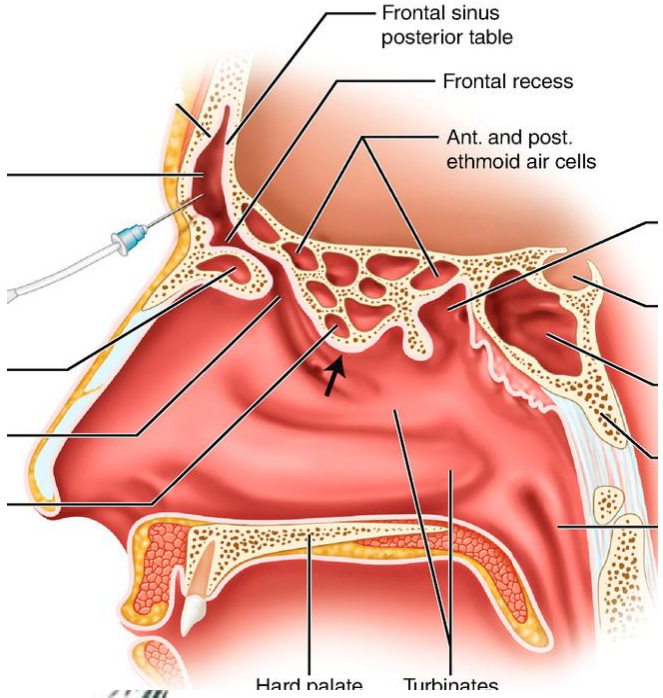
# Paranasal sinuses



## *Functions of the paranasal sinuses:*

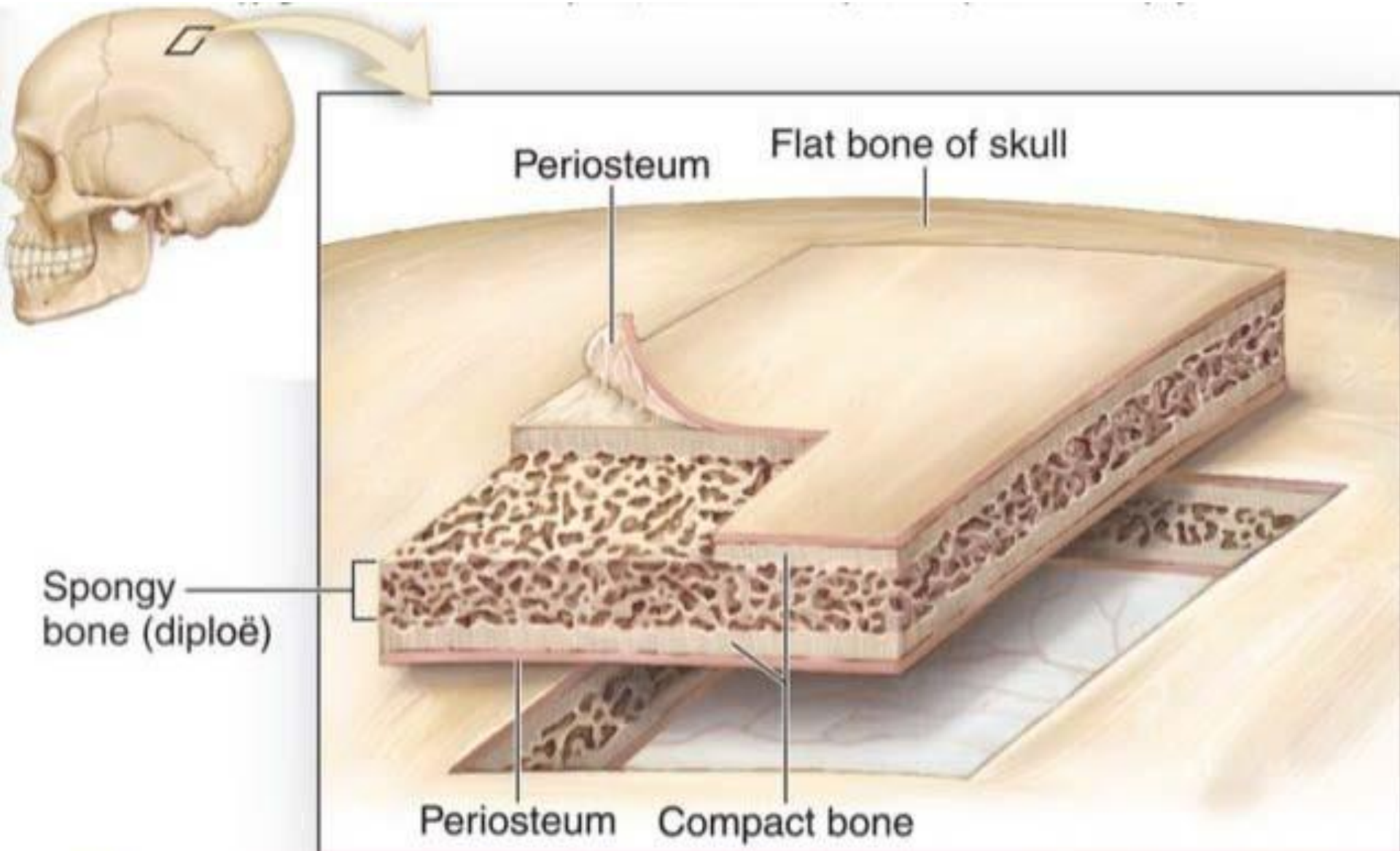
- **Decreasing the relative weight of the front of the skull**, and especially the bones of the face.
- Increasing the **resonance of the voice**.
- Providing a buffer against **blows to the face**
- Protection of the brain and sense organs against changes of temperature.
- The paranasal sinuses are not the only sinuses within the skull: the **mastoid cells** in the **mastoid bone** around the **middle ear** are also a type of sinus.
- **Insulating the sensitive structures** like dental roots and eyes from rapid temperature fluctuations in the nasal cavity.
- **Humidifying and heating of inhaled air** because of slow air turnover in this region.

# Pneumatic bones



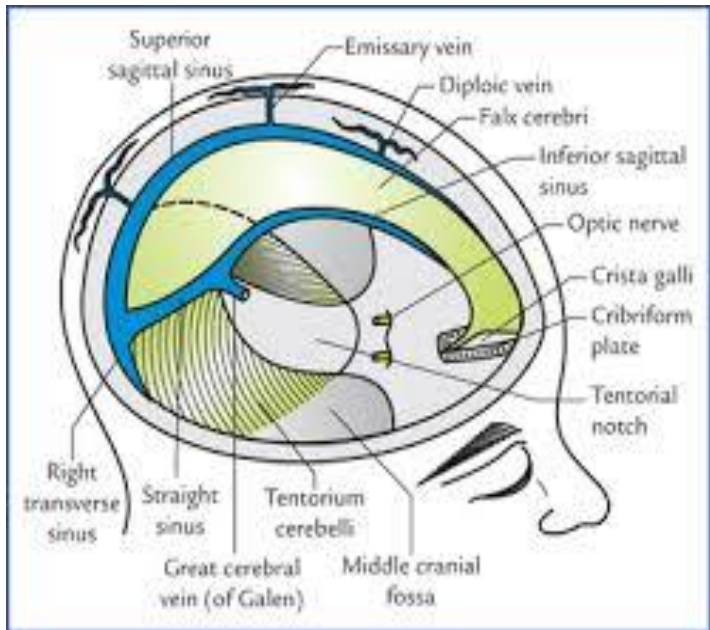


# Diploe





# EMISSARY VEINS



Because the **emissary veins are valveless**, they are an important part in selective brain cooling through bidirectional flow of cooler blood from the evaporating surface of the head. In general, **blood flow is from external to internal but the flow can be altered by increased intracranial pressure.**

1. **Parietal emissary vein** passes through the parietal foramen and connects the veins of the scalp to the superior sagittal sinus.
2. **Mastoid vein** (most constant) passes through the mastoid foramen and communicates the posterior auricular vein with the sigmoid sinus.
3. **A vein through hypoglossal canal** connects the sigmoid sinus with internal jugular vein.
4. **A vein through the posterior condylar canal** unites the sigmoid sinus with sub-occipital venous plexus.
5. **Emissary veins connecting cavernous sinus with pterygoid venous plexus** are as follows:
  - (a) *Veins of the foramen ovale;*
  - (b) *Veins of the foramen spinosum;*
  - (c) *Veins of the foramen Vesalii or the sphenoidal emissary foramen* in the great wings of the sphenoid bone, medial to the foramen ovale, a small aperture,, may occasionally be seen;
  - (d) *Veins of the foramen lacerum.*
6. When **foramen caecum** is present (1%), a vein connects the superior sagittal sinus with the veins of nasal cavity.
7. **Petro-squamous sinus**, if present, connects the transverse sinus with external jugular vein.
8. **A plexus of veins around internal carotid artery** connects the cavernous sinus with the internal jugular vein.
9. An **occipital emissary vein** occasionally connects the confluence of sinuses with the occipital vein.
10. **Ophthalmic veins** act as large emissary veins and connect the facial vein via the angular vein with the cavernous sinus.
11. **Middle meningeal veins** sometimes connect the superior sagittal sinus with pterygoid venous plexus.
12. **Inferior petrosal sinus** acts as emissary vein and connects the cavernous sinus with the internal jugular vein.

# Skull pillars of resistance

## Pillars of the facial skull:

**1. Frontonasal:** incisors and canines – frontal process of maxilla – glabella and superciliary arch.

**1. Zygomatic:** the I premolar – zygomatic bone:

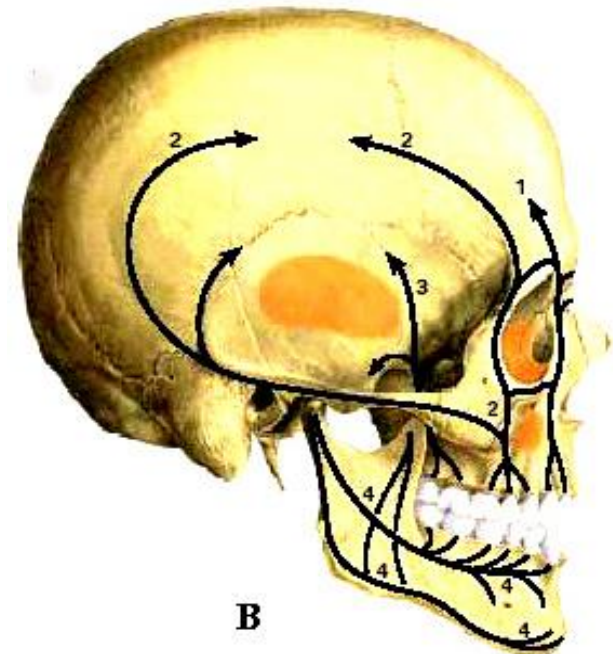
a) zygomatic arch and temporal bone;

b) frontal process – frontal bone.

**3. Pterygopalatine:** molars – maxillary tuber – pterygoid process of the sphenoid bone – body of the sphenoid bone.

**4. Palatine:** teeth – transverse lamina of palatine bone and palatine process of the maxilla – teeth of opposite part.

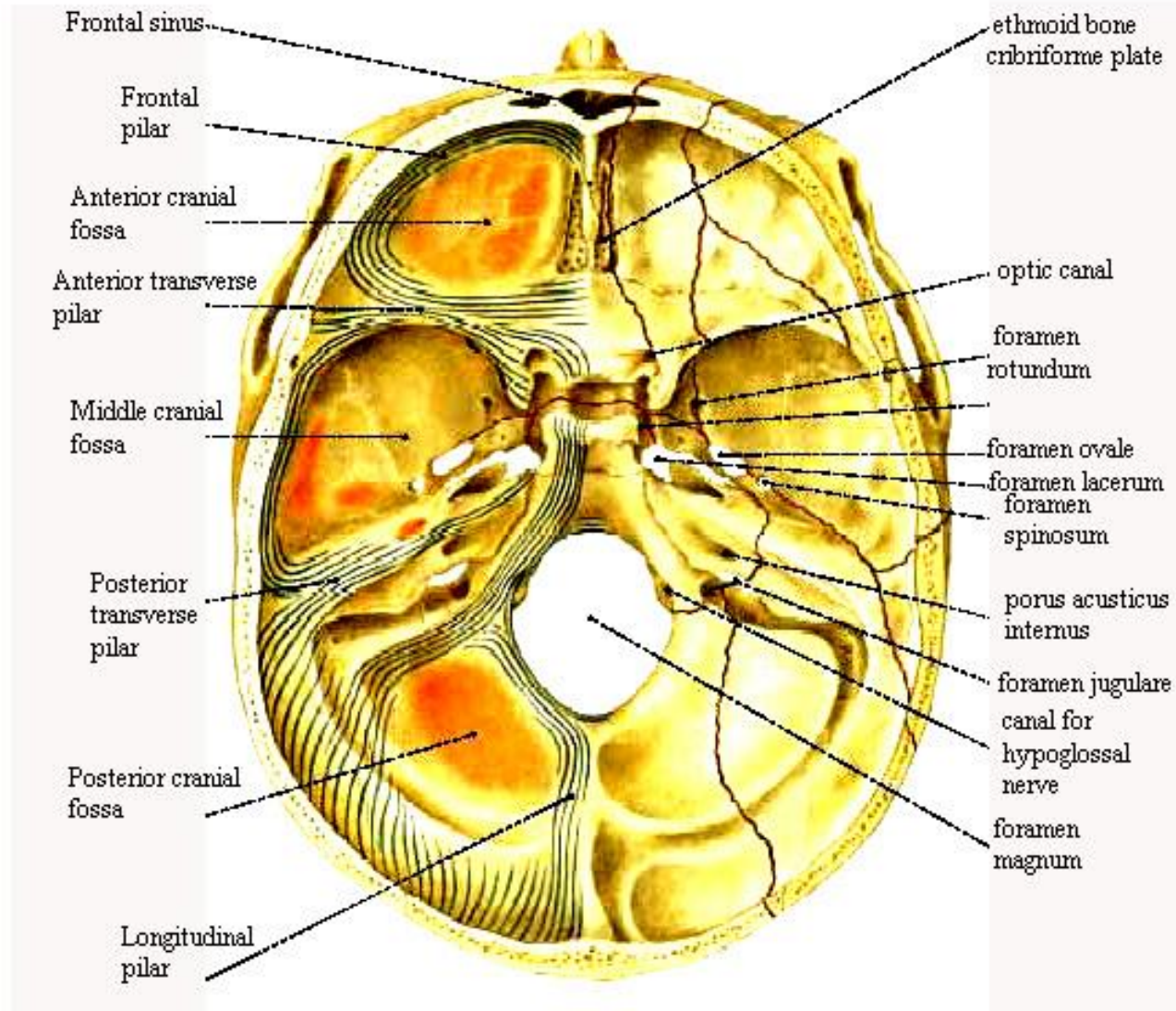
**5. Mandibular:** lower dental arch – neck and head of mandible – temporal bone.



# Skull pillars of resistance

## Pillars of resistance of the skull base

1. Anterior transverse pillar
2. Posterior transverse pillar
3. Longitudinal pillar





# Individual variability of the skull

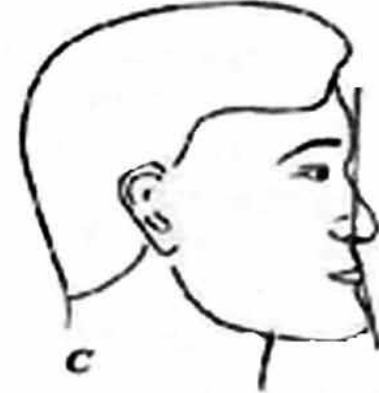
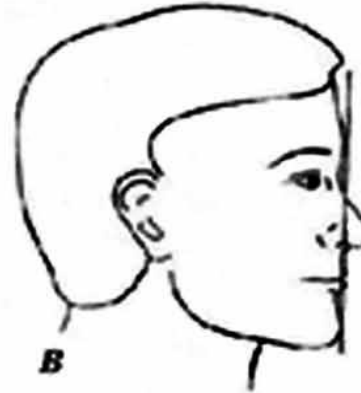
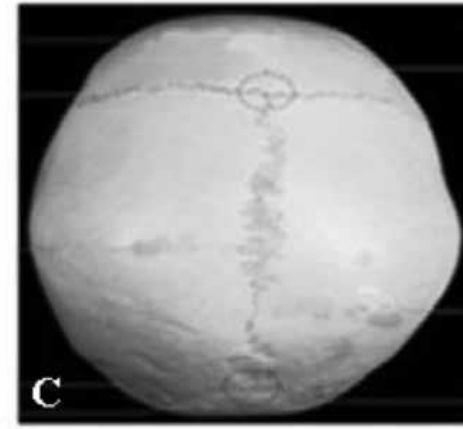
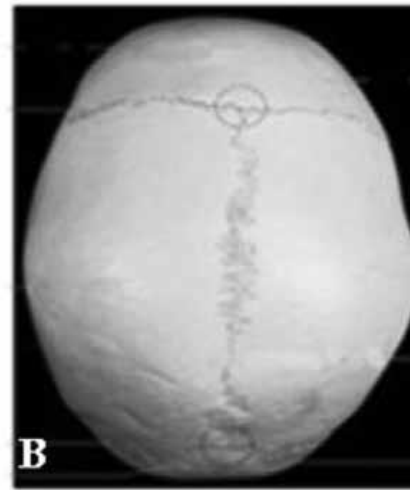
## Indexes of the skull

The longitudinal cephalic index =  $\frac{\text{transverse diameter (in cm)}}{\text{anteroposterior diameter (in cm)}} \times 100$  reported to the

If the obtained value is 75 or less it is characteristic of the **dolichocephalic skull** or long skull.

When the value is from 76 to 79 the skull is considered to be **mesocephalic**.

The value of 80 and more is characteristic of the **brachycephalic skull** or short skull.



**Facial profiles: convex (A), straight (B), concave (C).**

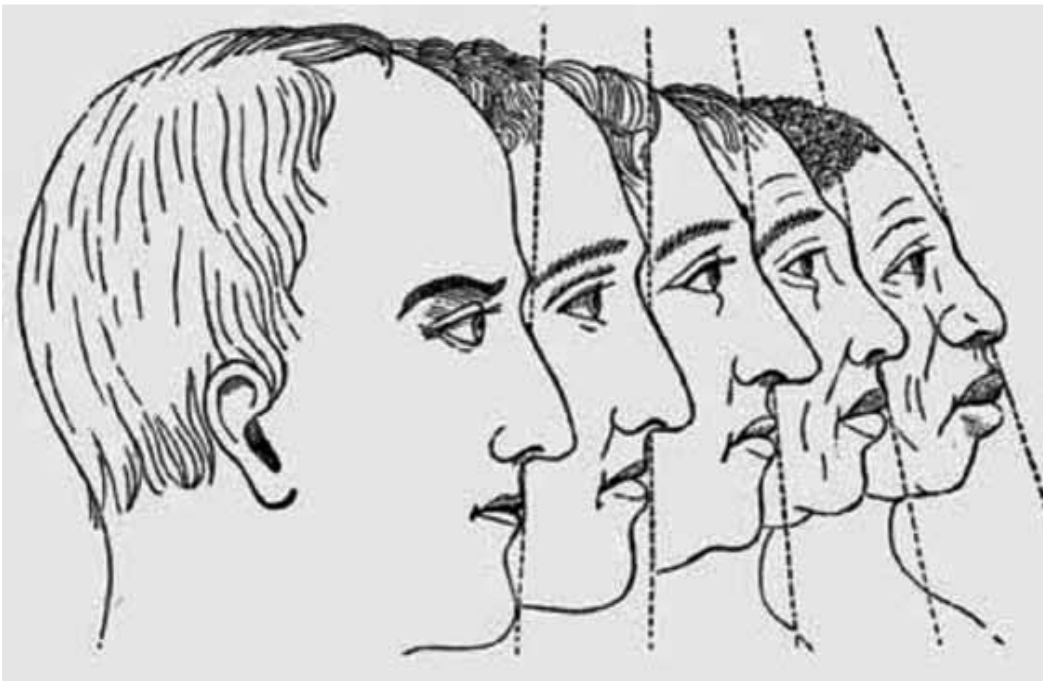
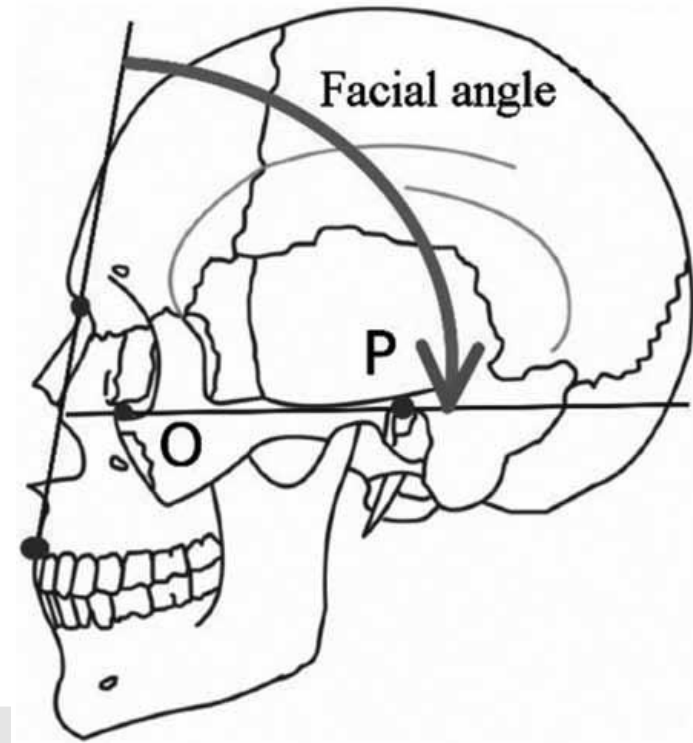
## Size of the skull

- Skulls vary in size and shape, and the term craniology is applied to the study of these variations.
- **Microcephalic**, with a capacity of less than 1350 ml - ex. those of native Australians and Andaman Islanders.
- **Mesocephalic**, with a capacity of from 1350 mL to 1450 ml- ex. those of African negroes and Chinese.
- **Megacephalic**, with a capacity of over 1450 ml - ex. those of Europeans, Japanese and Eskimos.

# Facial angle

The *facial angle* (also the *Camper's* or the *Topinard's facial angle*) is formed by *the profile line* (traced between the nasion and prosthion) and *the horizontal Frankfurt plane* measured in degrees.

According to the size of this angle, *3 types of the facial skull* are distinguished: *prognathy* (if angle is  $70^{\circ}$ - $79.9^{\circ}$ ), *mesognathy* ( $80^{\circ}$ - $84.9^{\circ}$ ) and *orthognathy* ( $85^{\circ}$ - $92.9^{\circ}$ ).



# GENDER PECULIARITIES OF THE SKULL

- Until the age of puberty there is little difference between the skull of the female and that of the male.
  - The female skull differs from the male by less dimensions.
    - The males have a deeper cranium
    - The male forehead is lower and more sloppier
- *The males cranial mass* is more blocky and massive compared to the female's which is rounder and tapers at the top.

1. **Superciliary arches** are more prominent in males
2. **Fronto-nasal junction** is smooth in the females & angular in the male
3. **A woman's supraorbital margin** (the ridge above the eyes) is sharper, while the male's is rather round and dull
4. **The superciliary arches and glabella** are more prominent in males;
5. **The frontonasal junction** is smooth in females and angular in males.
6. **The zygomatic bone** is more pronounced on the male skull.
7. **Nuchal lines** are rough in males and smooth in females
8. **Mastoid processes** are well developed in males



# Development of the neurocranium

## Base of the skull

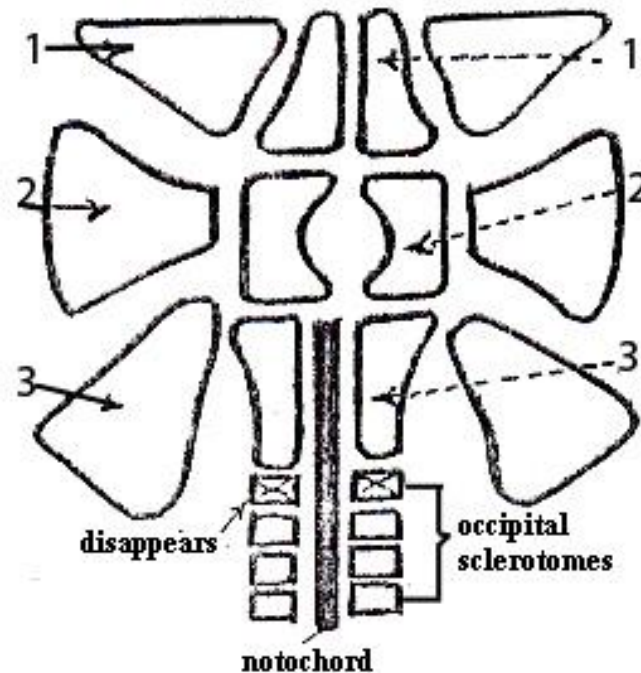
Develop by cartilaginous ossification (secondary bones) of 6 pairs of cartilages: 3 lateral & 3 medial.

## Skull cap

Develop by membranous ossification (primary bones)

### Lateral cartilages:

1. The orbitosphenoid – forms the lesser wing of sphenoid
2. The ali-sphenoid – forms the greater wing of sphenoid
3. The periotic capsule – forms the petrous and mastoid parts of the temporal bone



### Medial cartilages:

1. Cranial trabeculae – fuse to form the ethmoidbone
2. Hypophyseal cartilages – fuse to form the body of sphenoid bone
3. Parachordal cartilages – fuse with 3 occipital sclerotomes to form the basilar and lateral parts of occipital bone

# Development of the cerebral skull

Bones of the neurocranium are derivatives of 3-4 pairs of the cephalic sclerotomes. In the 3<sup>rd</sup> week of the intrauterine life is formed the membranous skull.

In the 7-th week the formation of the cartilaginous base of the skull occurs.

The membranous ossification of the calvaria (skull cap) starts in the central part of each bone and spreads radially in all directions by apposition of the bone substance on the periphery.

*The skull-cap* develops by membranous ossification (*primary bones*).

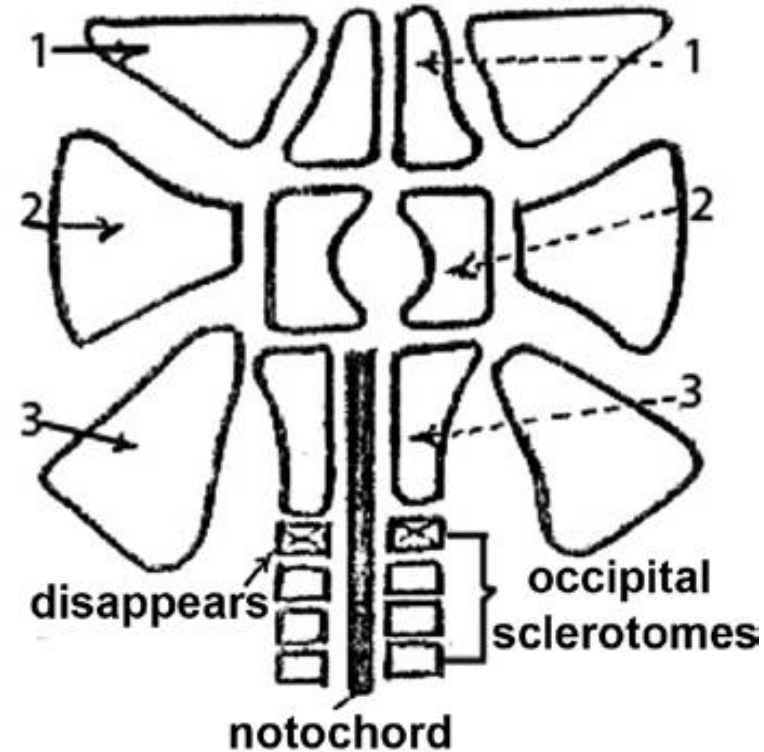
*The base of the skull* develops by means of *cartilaginous ossification* (*secondary bones*) of 6 pairs of cartilages: 3 lateral and 3 medial.

## Lateral cartilages:

1. *Orbitosphenoid* - it forms the lesser wing of sphenoid.
2. *Alisphenoid* - it forms the greater wing of sphenoid.
3. *Otic capsule* - it forms the petrous and mastoid parts of the temporal bone.

## Medial cartilages:

1. *Trabecular (or prechordal) cartilages* - they form the ethmoidal bone.
2. *Hypophyseal cartilages* - they fuse to form the body of the sphenoidal bone.
3. *Parachordal cartilages* - they fuse with 3 occipital sclerotomes to form the basilar and lateral parts of the occipital bone.



# Development of the cerebral skull

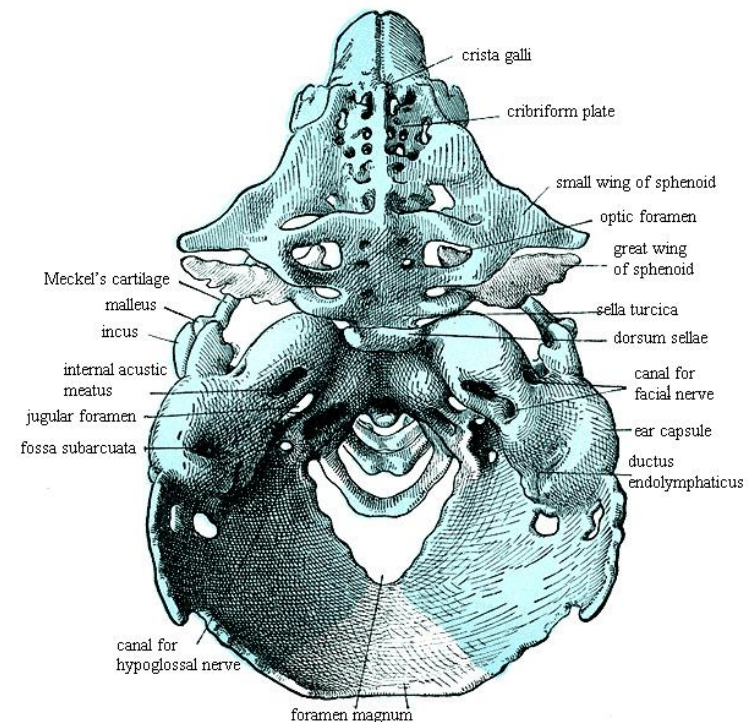
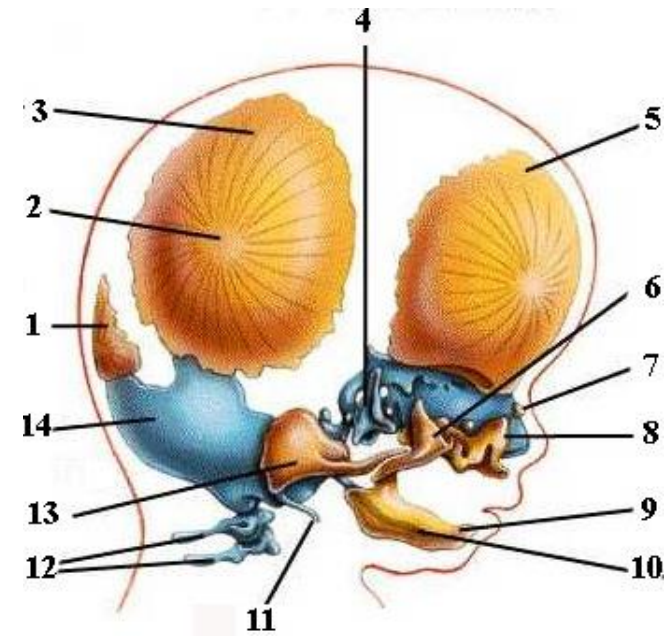
The bones of the neurocranium are derivatives of 3-4 pairs of the cephalic sclerotomes.

At III-d week of the intrauterine life mesenchyme is transformed into the membranous skull.

Membranous ossification of the skull callote (skull cap) starts at the central part of each bone and spreads radially in all directions by apposition of the bone substance on the periphery.

The **skull cap bones** are **primary**, those of the **skull base** – are **secondary**.

At VIIth week - formation of the cartilaginous base of the skull .





# Pharyngeal (branchial) arches

• **Definition:** the pharyngeal arches are 6 curved cylindrical mesodermal thickenings on each side of the primitive pharynx. Each arch forms a swelling on the outer surface of the embryo and a swelling on the wall of the pharynx internally.

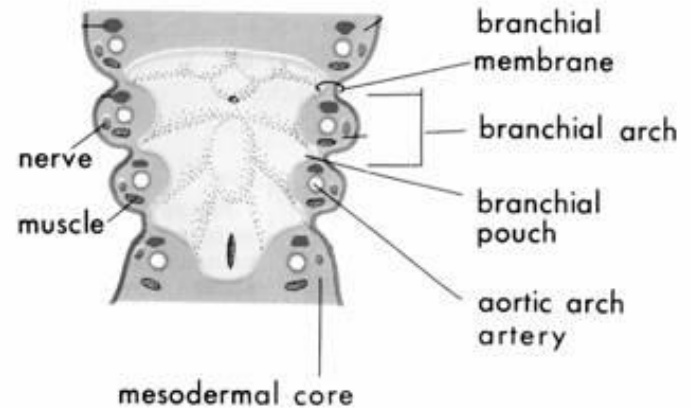
• **Formation:** they are produced by the proliferation of the mesoderm of the lateral wall of the pharynx forming 6 arched thickenings.

## Each arch consists of:

an outer ectodermal covering,  
an inner endodermal lining,  
a mesodermal core between the ecto- and endoderm.  
The arches are separated from each other externally by 5 grooves called *pharyngeal clefts*;  
internally – 4 grooves – *pharyngeal pouches*.

• **Time of appearance:** 4-5 weeks of embryonic life.

• **Fate:** after 5 weeks they become transformed into bones, cartilages ligaments, muscles and vessels of the head and neck.



-A large portion of the face and neck is derived from structures known as pharyngeal arches.

-There are five pharyngeal arches numbered from 1 to 6; the viscerocranium is primarily formed from Arch 1 and 2.

-Each arch contributes not only to development of a particular portion of the skull, but also to the creation of specific muscles, nerves and blood vessels.

-The basic pattern and creation of facial bones is concentrated to weeks 4-10 of embryonic development.

-The bony and cartilaginous structures of the viscerocranium also develop by both

endochondral and intramembranous ossification.

# Development of the face

## Ist stage. Formation of 5 processes around the stomodeum

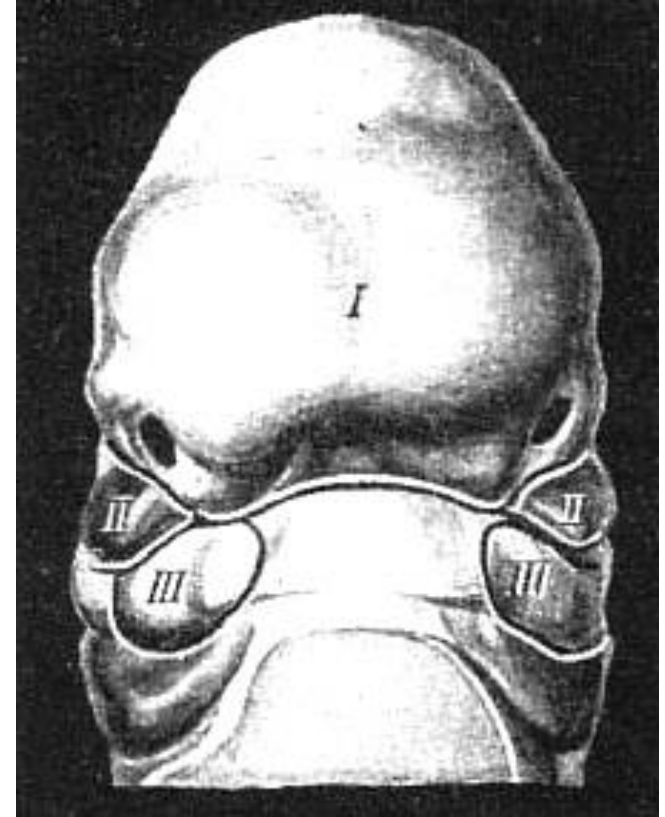
The upper part of the head fold projects downward and forwards to form the **frontonasal process**.

The pericardial swelling project upwards. A depression (**stomodeum = primitive mouth**) is formed between the previous 2 swellings. Pharyngeal arches appear on either side of the pharyngeal gut.

The first pharyngeal arch develops 2 processes: **mandibular and maxillary**.

The stomodeum becomes surrounded by 5 processes:

- Frontonasal – cranially;
- 2 maxillary – on each side;
- 2 mandibular – caudally.



## II. Differentiation and fusion of the 5 processes

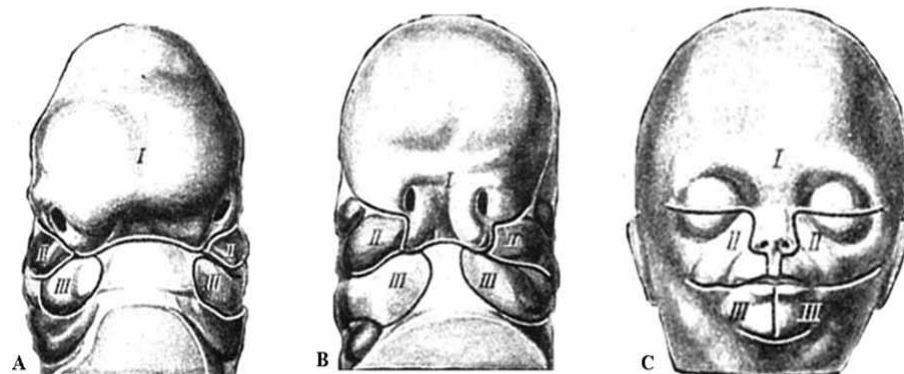
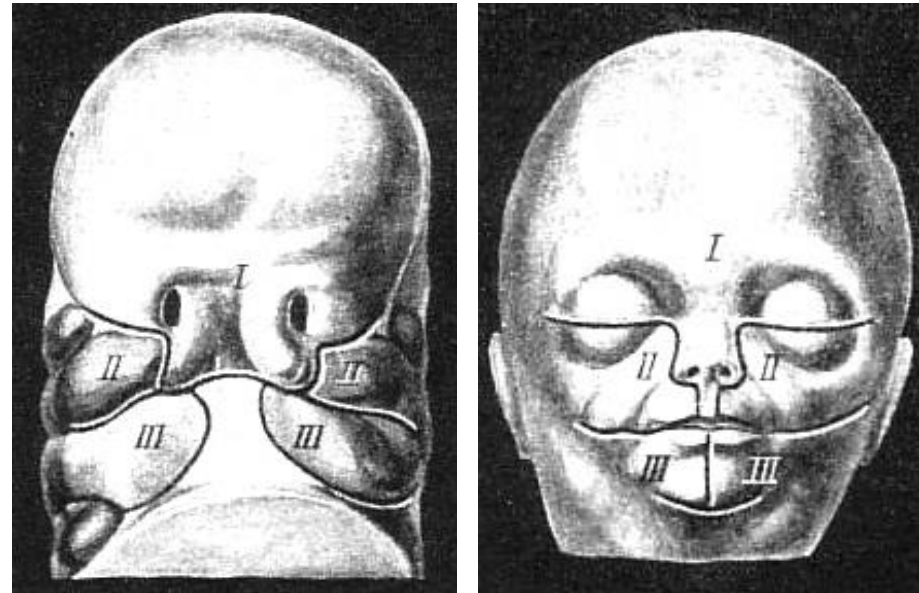
The *frontonasal process* gives rise to the nose, nasal cavity, theiltrum of the upper lip; the anterior part of the maxilla and hard palate.

Each *maxillary process* grows medially and approaches the medial and lateral nasal folds but remains separated from them by nasolacrimal groove which later will form nasolacrimal duct.

The maxillary processes fuse with the medial nasal folds of the frontonasal process to form the upper lip (exceptiltrum).

Each maxillary process unites: anteriorly: with the lateral nasal fold along the side of the nose; posteriorly: with mandibular process to form the cheek.

The *mandibular processes*: fuse above with the maxillary process forming the cheeks; fuse with each other medially to form the lower lip and cheek.





# Skeletal derivatives of the pharyngeal arches

<b>Arch</b>	<b>Derivatives</b>
<b>I</b>	<b>Dorsally: incus, malleus</b> <b>Ventrally: anterior part of the body of mandible (the rest of mandible develops by membranous ossification)</b>
<b>II</b>	<b>Stapes, styloid process,</b> <b>Lesser horn and upper part of the hyoid body</b>
<b>III</b>	<b>Greater horn and lower part of the hyoid body</b> <b>Stapes</b>
<b>IV</b>	<b>Thyroid cartilage of the larynx</b>
<b>V</b>	<b>Degenerates</b>
<b>VI</b>	<b>All cartilages of the larynx except the thyroid</b>

# Ossification of skull bones



## Membranous ossification:

Frontal

Parietal

Maxilla

Zygomatic

Nasal

Lacrimal

Palatine

Inferior nasal concha

## Cartilaginous ossification:

Ethmoid

Conchae of the nose

## Membranous and cartilaginous ossification:

Occipital

Sphenoid

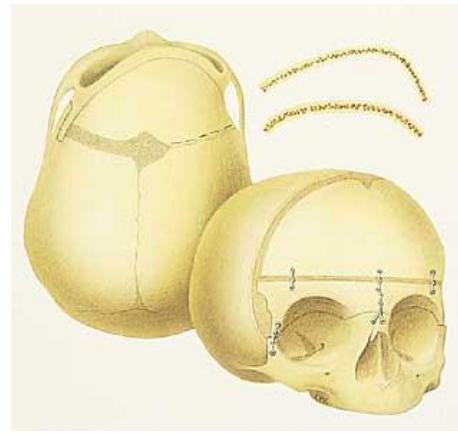
Temporal

Mandible

Premature fusion of the *coronal sutures* results in an *asymmetric forehead and brow*. On the affected side the forehead is flattened and recessed with the brow and supraorbital rim both elevated and recessed.

The contralateral forehead may exhibit compensatory bulging or bossing. This ultimately results in a very asymmetric

malformation called *plagiocephaly*.



*Bicoronal suture* fusion results in a flat retruded forehead with increased height to the skull. This condition is also called

*brachycephaly* due to the short anteroposterior diameter. As a result of this shortening there is a compensatory bulging of

the transverse diameter or width of the skull.







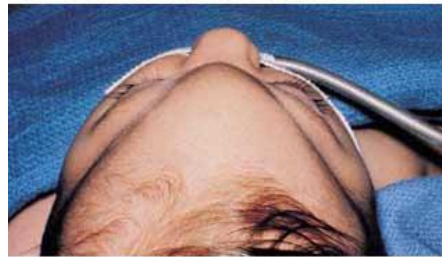
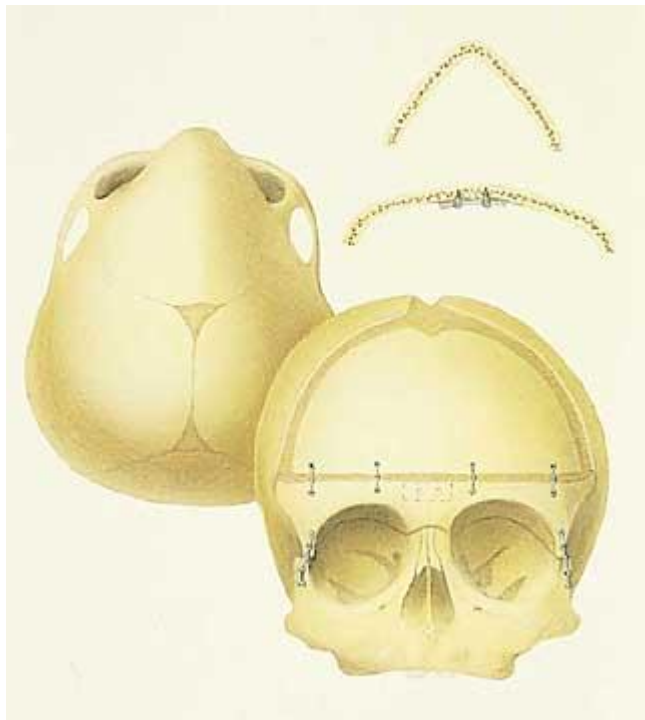
Premature closure of the *sagittal suture*, the longitudinal suture on the top of the head, stops growth laterally producing a narrow

head - *scaphocephaly*.

The *metopic suture* runs down the midline of the forehead.

Premature fusion of this suture results in a triangular shaped forehead called

**trigonocephaly**



# Anomalies of the facial skull



**“U” shaped cleft palate**

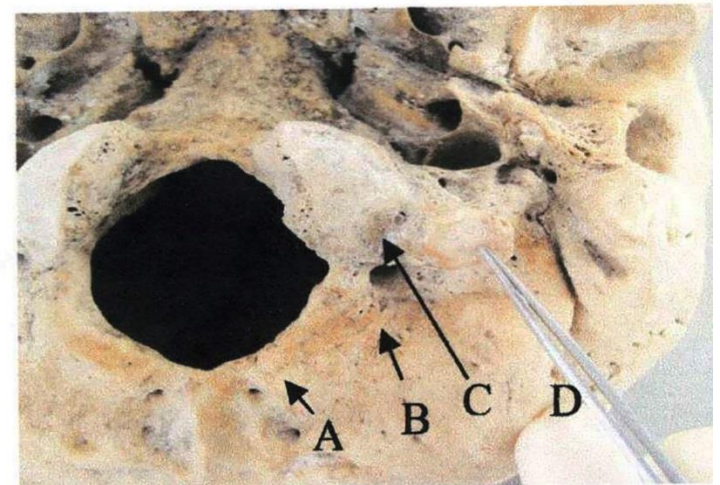


**“V” shaped cleft palate**



# Abnormalities of the skull

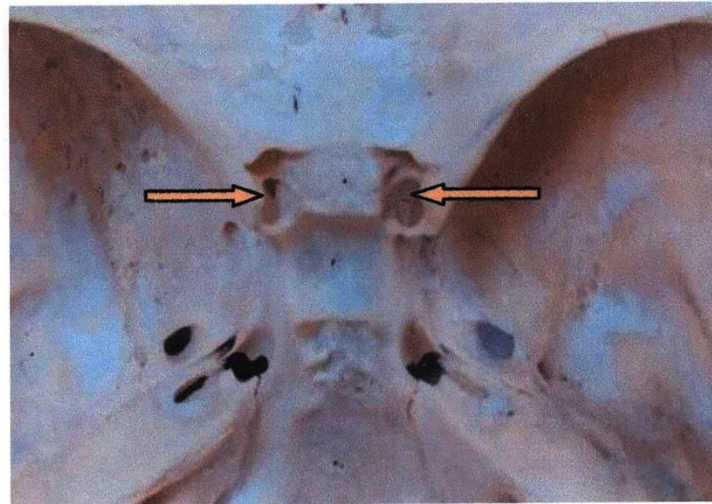
- **Microcephalia** – the skull does not grow because the brain stops its development.
- **Cranioschisis** – the absence of the vault of the skull.
- **Macrocephalia** – great disproportional dimensions of the skull.
- **Hidrocephalia** – voluminous skull (when there is a lot of cerebrospinal fluid inside the cerebral ventricles).
- **Persistence of the craniopharyngeal canal** in the Turkish saddle (it contains remnants of the pharyngeal recess).
- **Common spinosum** and **ovale orifices** or **absence spinosus** .
- **Clinoideocarotid foramen** (when the anterior clinoid process is connected with the body of the sphenoid bone).
- **Assimilation of the atlas by the occipital bone (occipitalization)**.
- **Presence of the paramastoid process** (when there is additional process in close relationship with the mastoid one) - extension of the **procesus jugularis**;





# Anomalies of the skull bones

- Presence of the *the foramen clinoideocaroticum* formed by fusion of the anterior clinoid process with the body of the sphenoid (through which the internal carotid passes) ;
- Union of the *processus clinoideus medius* and *processus clinoideus posterior*;
- Presence of the *os transversum cranii* (*os Incae*, described by *Bellamy*) – separation of the upper part of the occipital squama by a fissure, resulting in formation of a **separate** bone ;
- Variability of degree of development of the *protuberantia occipitalis externa* depending on the power of the muscles inserted on it



# Anomalies of the skull bones

- *Condylus occipitalis tertius* - is a rare anatomic variant of the occipital condyles (also known as **condylus tertius** or **median**). It is a small separate ossicle at the anteromedial margin of the occipital condyle;
- *Metopic suture* – separated right and left parts of the frontal bone;
- Lack (very rare) of the *frontal sinus*;
- Existance of the *concha nazalis suprema* (characteristic for many mammals);
- Separation of the *foramen jugularis* into two parts by the *procesus intrajugularis*

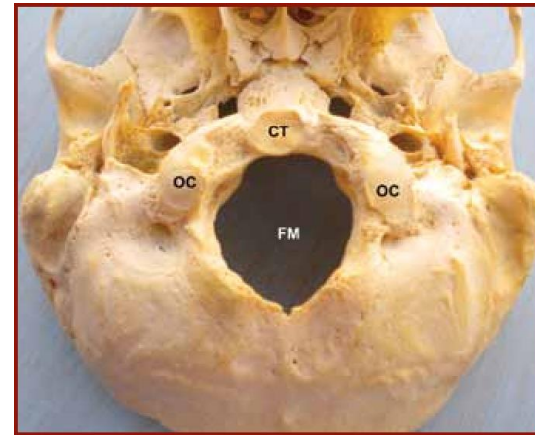
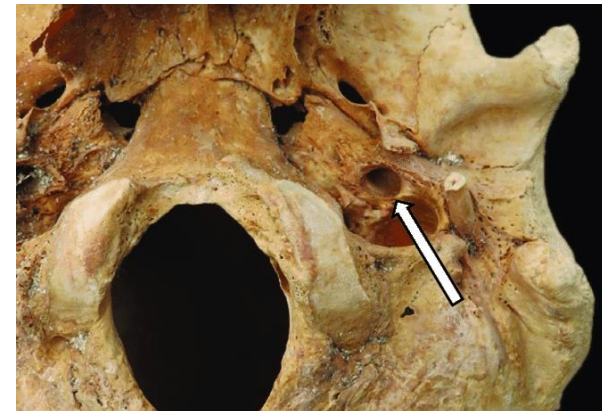


Figure 2 Picture of the normal basilar of the human skull showing.

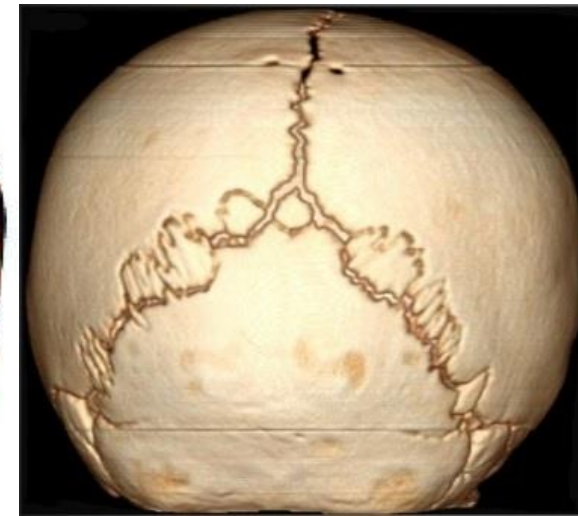


Metopic suture



# Anomalies of the skull bones

- *Processus styloideus* may lack, may be *very long* or *bent*;
- *Sinus maxilaris (Highmori)* may have different shapes and dimensions, can also penetrate into the zygomatic bone;
- *Existence of the intraparietal bone*;
- *Separation of the parietal bone* into two halves;
- *Wormian* or *sutural bones* – result of existence of the points of ossification in the sutures, if these appear in the fontanelle – *ossa fonticularia*.





# Variants of the bones of the viscerocranium

## *The lacrimal bone*

The shape and dimensions of this bone are not constant, and in case of its absence it is substituted by the excessive growth of the frontal process of the maxilla or by the orbital plate of the ethmoid bone.

## *The maxilla*

The dental sockets may frequently vary in number and shape. Sometimes an additional incisive bone which is characteristic for mammals can be present. The incisive canal and the maxillary sinus may vary in shape and size. The most redoubtable developmental abnormality of the maxilla is the fissure of the hard palate (palatum fissum).

## *The inferior nasal concha*

This bone frequently varies in shape and size, but its processes vary most.

## *The vomer*

The vomer can be curved to the right or to the left side.

## *The mandible*

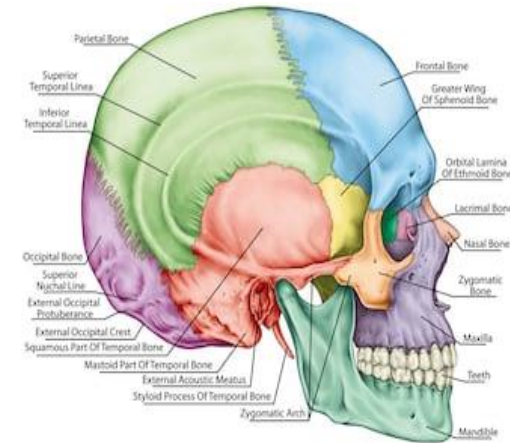
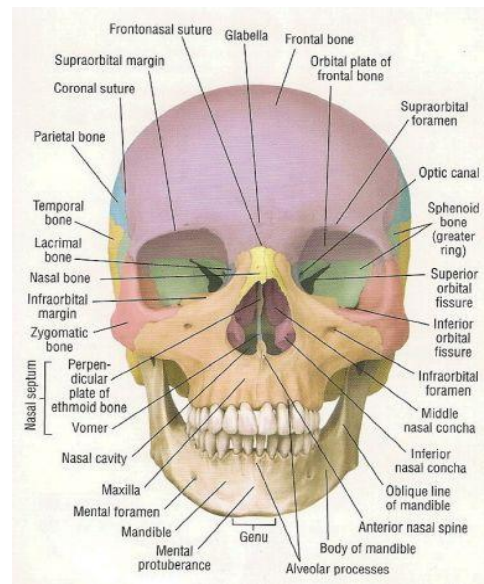
The right and left sites of its body often are asymmetrical. The mandibular and mental orifices can be double, and so can the mandibular canal.

## *The hyoid bone*

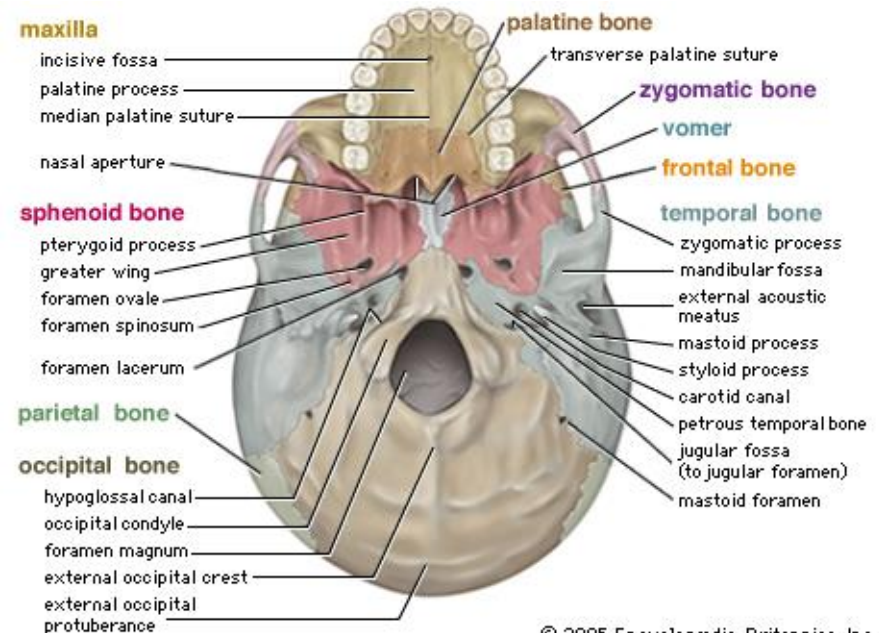
# Examination of the skull on a living person

The following structures can be palpated on the **cerebral skull**:

- a) the supraorbital margins of the frontal bones,
- b) the supraorbital notch,
- c) the glabella,
- d) the metopic suture,
- e) the supreciliary arch,
- f) the frontal and parietal tubers,
- g) the superior temporal line,
- h) the temporal surface of the greater wings of the sphenoid bone,
- i) the temporal squama,
- j) the mastoid process,
- k) the spina suprameatum (it is used as a reference point in trepanation of the mastoid antrum),
- l) the initial portion of the external auditory meatus (the other part of the external auditory meatus can be examined by otoscopy)
- m) the spina suprameatum, which is used as an reference point in trepanation of the mastoid antrum,
- n) in children until 1 - 2 years of age the **frontal fontanelle** can be palpated and the **occipital** one can be palpated until 2 – 3 months.
- o) the external occipital protuberance,
- p) the superior nuchal lines.



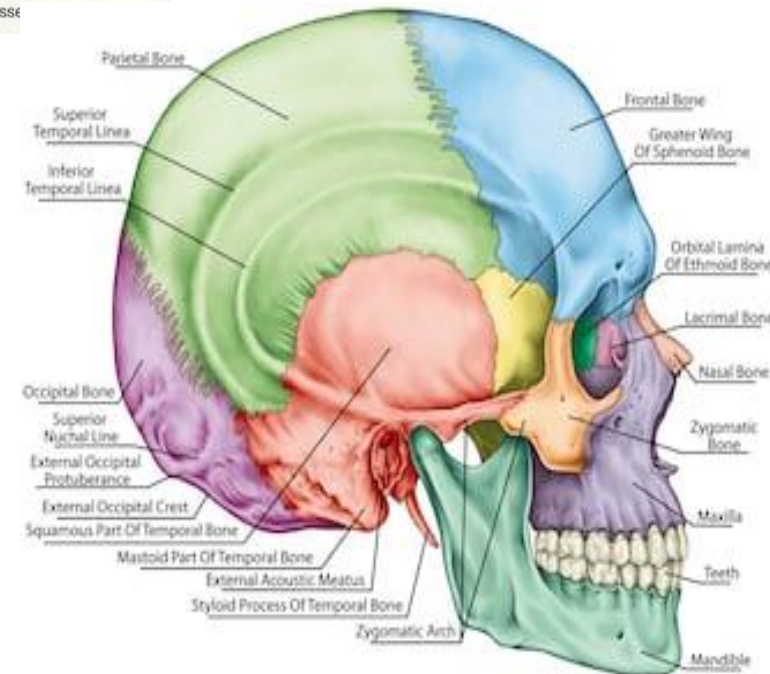
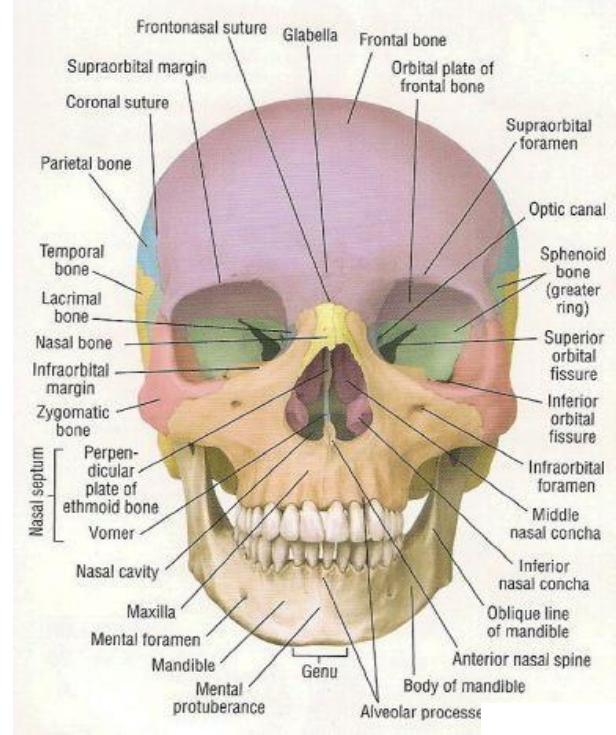
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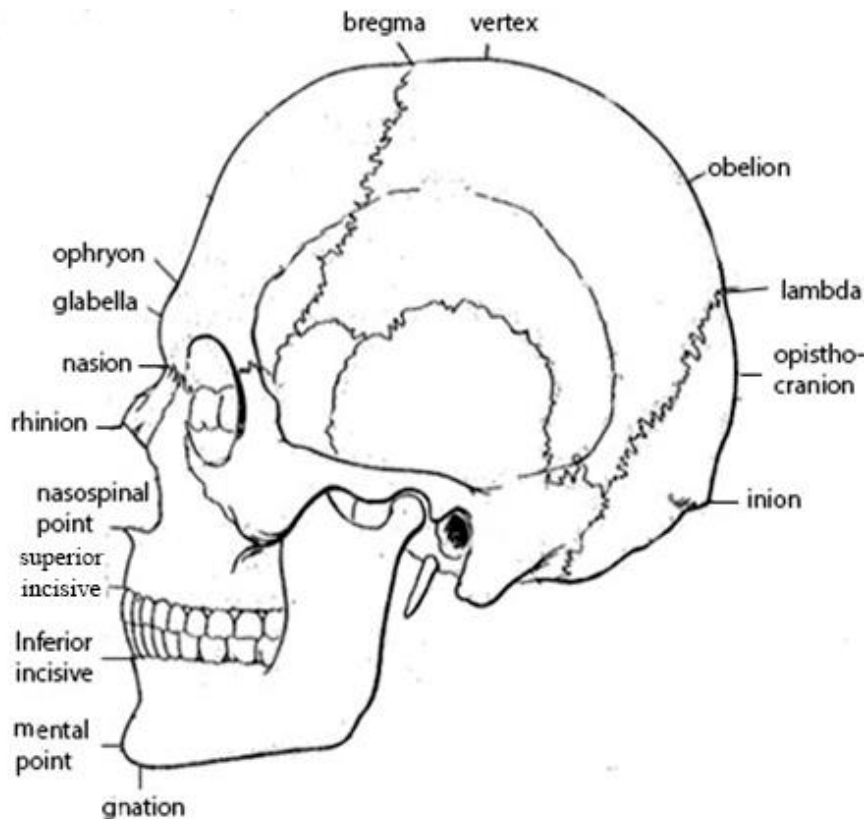
The following structures can be **palpated on the facial skull:**

- a) *zygomatic bones, the zygomatic arch,*
- b) *the head of the mandible,*
- c) *the mandibular angle,*
- d) *the inferior margin of the body of the mandible*
- e) *nasal bones, the margins of the piriform aperture, the anterior nasal spine,*
- f) *the mental protuberance,*
- g) *the posterior margin of the mandibular branch,*
- h) *the inferior margin of the mandible,*
- i) *the mandibular head* can be palpated with a finger introduced into the external acoustic meatus.
- j) through the vestibulum of the mouth and the oral cavity proper, *the alveolar arches* and *juga alveolaria,*
- k) *the hard palate,*
- l) *the canine fossa*
- m) *the infraorbital* and *mental orifices* are used for the trigeminal anaesthesia.





- An efficient method of examination of the skull shape, dimensions and modifications of its configuration in anthropology and medicine is the **craniometry**, or establishment of the dimensions and diameters of the skull.
- With this purpose, the reference points, termed **craniometrical points**, are used.



## Median craniometrical points

**Gnation** - the lowest point of the chin.

**The mental (symphysian) point** or **pogonion** - the most prominent point of the mental eminence.

**The inferior incisive point (infradental)** - between the median incisors of the mandible.

**The superior incisive point (prosthion)** - between medial incisors of the maxilla.

**Nasospinal point (spinal or ananthion)**- on the anterior nasal spine.

**Rhinion** - the inferior point of the suture between the both nasal bones.

**Nasion** - the point of intersection of the fronto-nasal suture with the median line.

**Glabella** - the median area situated between the superciliary arches.

**Ophryon** - the point of intersection of the frontal minimal diameter with the median line.

**Bregma** - point of intersection of the coronarian suture with the sagittal one.

**Obelion** - the point in which the sagittal suture is intersected by the line which unites to each other both parietal orifices.

**Lambda** - the point which unites the sagittal suture with the lambdoid one.

**Opisthocranium** - the most posterior point of the sagittal plane of the skull.

**Inion** - the point which corresponds to the external occipital protuberance.

**Opistion** - the median point of the posterior border of the foramen magnum.

**Basion** - the median point of the anterior border of the foramen magnum.



# Lateral craniometrical points

**The maxillofrontal point** is situated at the level of the suture between the frontal process of the maxilla and the frontal bone.

**Dacrion** is the point where the lacrimofacial and lacrimofrontal sutures meet.

**The malar point** is the most prominent point of the zygomatic bone.

**Pterion** is the point where the squama of the temporal bone, parietal bone and greater wing of the sphenoidal bone and frontal bone meet.

**The coronarian point** is the most lateral point of the coronal suture.

**Stephanion** is the point where the coronal suture meets the superior temporal line.

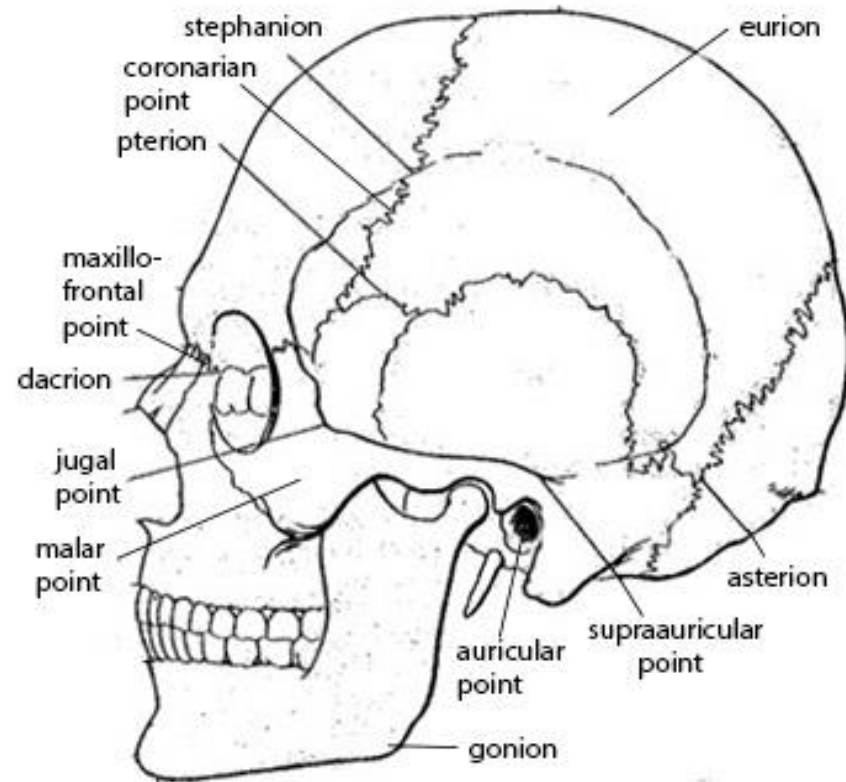
**Gonion** corresponds to the angle of the mandible.

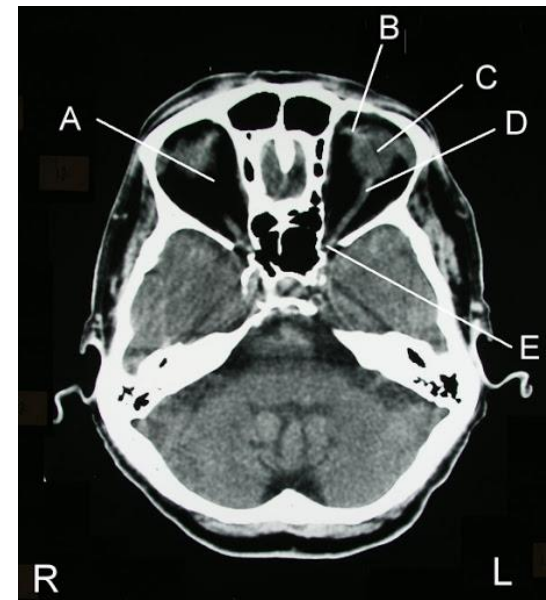
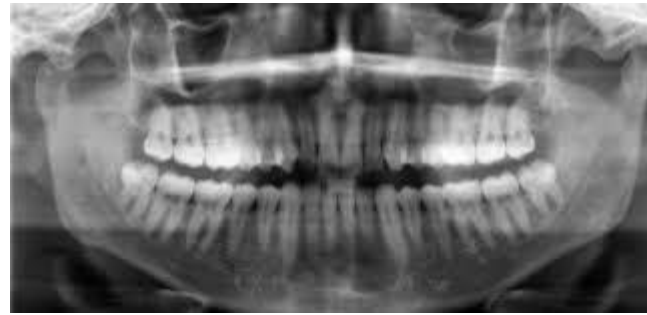
**The auricular point** is situated in the middle of the external auditory porus.

**Supraauricular point** – is placed above the zygomatic process of the temporal bone on the same vertical line with the auricular point.

**Eurion** is the highest point of the parietal eminence.

**Asterion** is the point where the temporal bone, the parietal one and the occipital bone meet.





- The bones of the skull can be examined by *X-rays*.
- *Rhinoscopy* can be used in the examination of the perpendicular plate of the ethmoid bone and the nasal concha.
- The other part of the external auditory meatus can be examined by *otoscopy*.



**END**