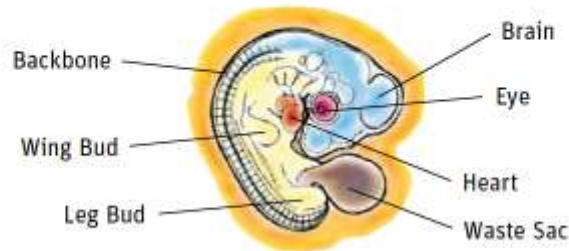
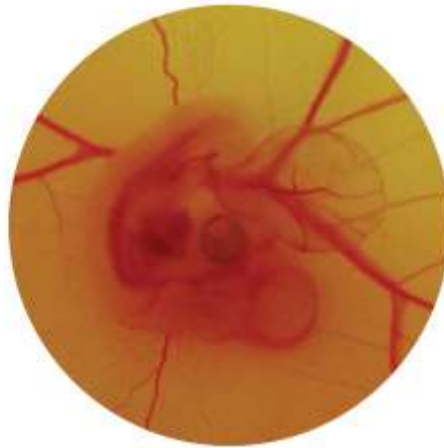


Development of Brain in Chick



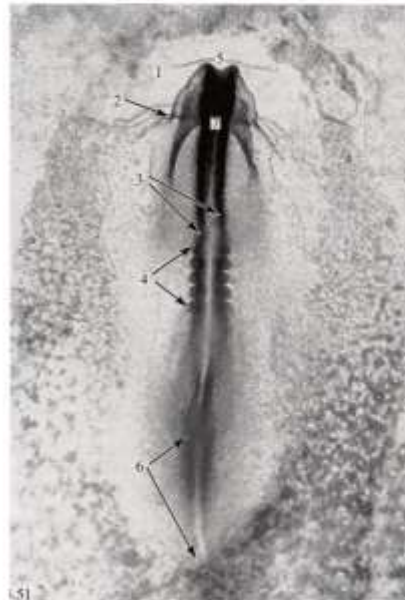
By Chaitali Barman
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A. Introduction:

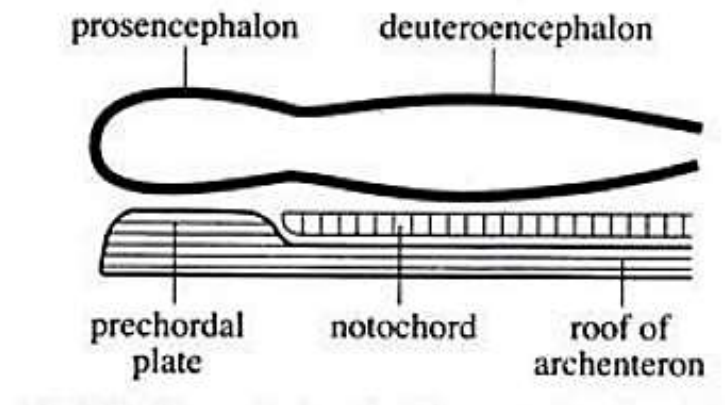
- Brain development in chick starts from neural tube formation.
- The neural tube is formed from the ectodermal tissue and is located dorsally in the median plain of the embryo (Back side of the embryo).
- Neural fold appears to enclose the neural tube which results in detaching the neural tube from the overlying ectoderm.
- Anterior part of neural tube is formed **future brain** and the posterior part of the neural tube becomes the **spinal cord**.

24 hours old chick embryo

- 1 . proamnion
- 3. neural folds
- 4. somites
- 5 . neuroporus anterior
- 6 . neural tube

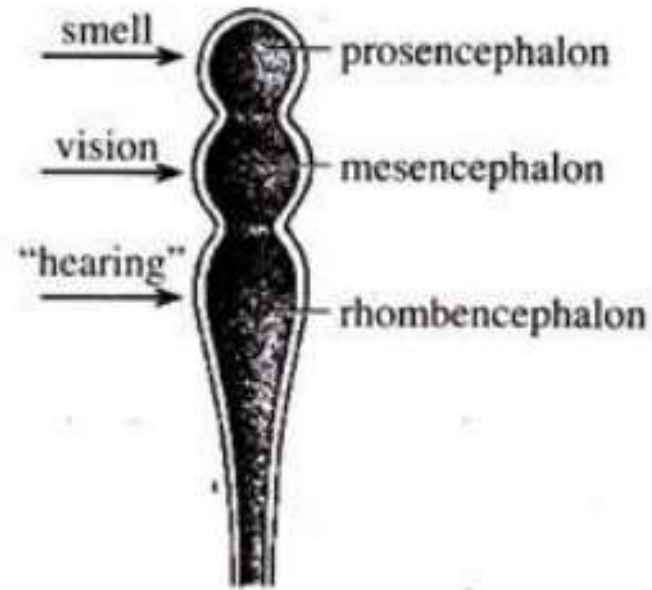


- Future brain is sub divided into anterior prosencephalon and posterior deuterioencephalon.



B. Formation of three part brain in chick

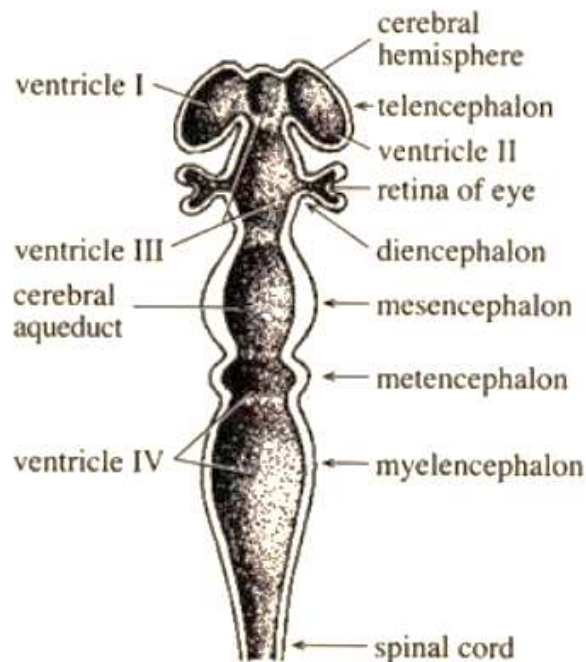
- Prosencephalon acts as fore brain.
- Deuterioencephalon is divided into two parts , one is mesencephalon i.e. the midbrain and rhombencephalon i.e. the hind brain .
- The procencephalon is associated with sense of smell, the mesencephalon with vision and rhombencephalon with hearing.



- The anterior part of the neural tube tends to form some segments which are called neuromeres. These neuromeres fuse to form the other parts of brain region.

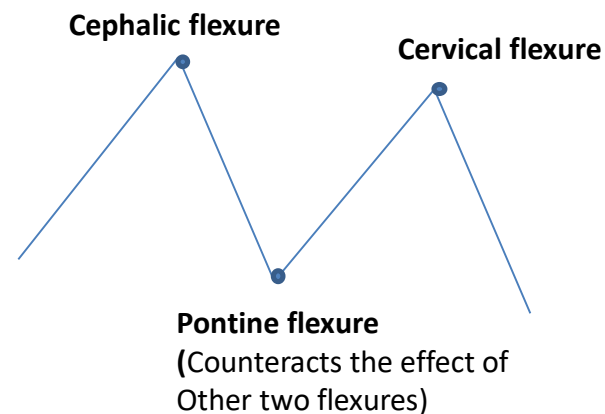
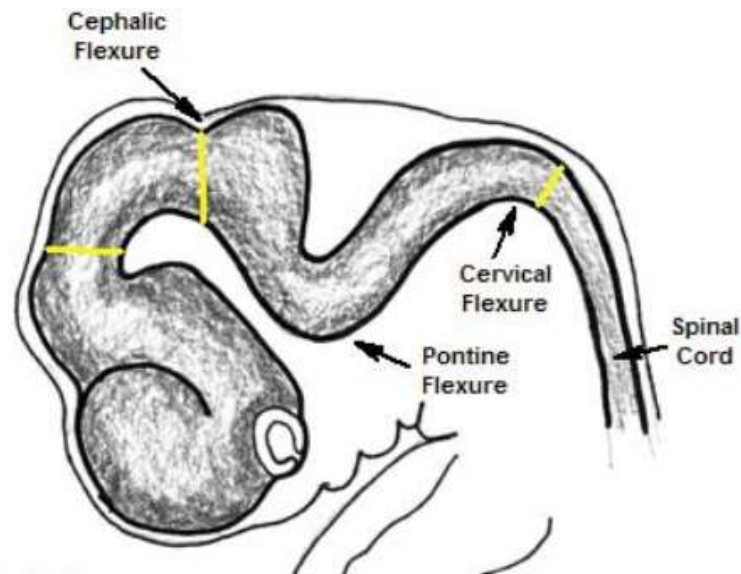
C. Formation of five part brain in chick

- Further embryonic modifications results in subdivision of two of the three brain regions.
- The procerebrum is then divided into anterior telencephalon and a posterior diencephalon.
- The mesencephalon remains intact during the process of brain formation.
- The rhombencephalon is also divided into two parts, forming an anterior metencephalon and a posterior medulla or myelencephalon.



D. Formation of flexures

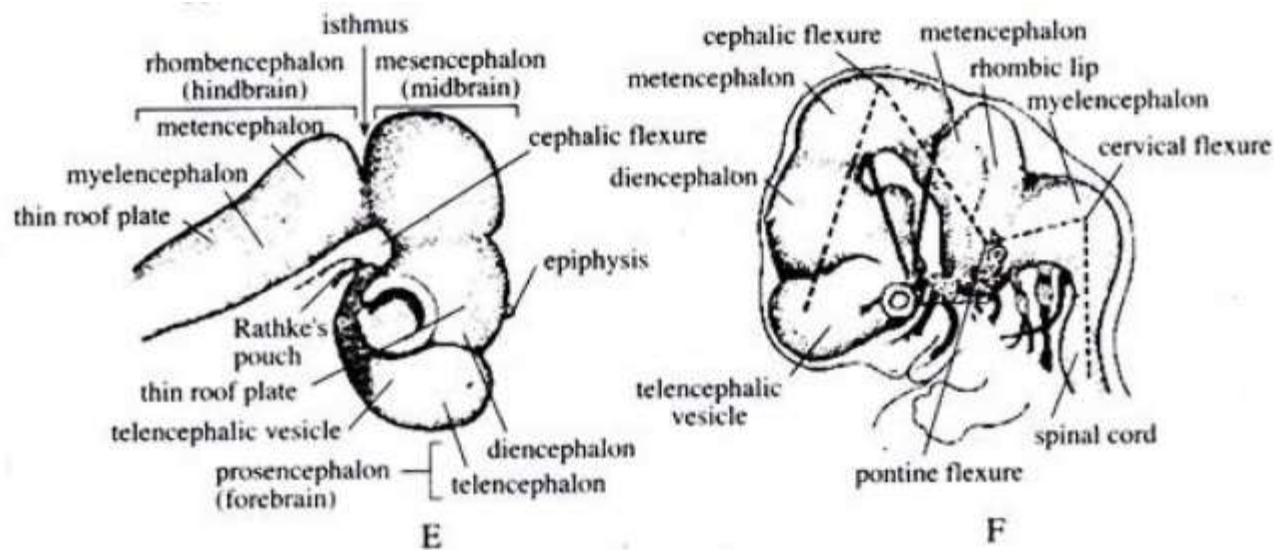
- In case of chick , the brain tends to bend upon itself by formation of flexures. Flexures are nothing but some bending.
- There are 3 flexures-
 1. Cephalic flexures occur at the mesencephalon region. It bends fore brain.
 2. Cervical flexures develop between myelencephalon (hind brain) and spinal cord. It bends the entire brain region.
 3. Pontine flexures appear between myelencephalon and metencephalon. It **counteracts** the effect of the other two flexures by bending the brain in the opposite direction.



E. Out-pocketing of the brain in chick

- As the five subdivisions of the brain are established, its wall exhibits a number of out-pocketings.
 - The telencephalon gives rise to two lateral pouches called the telencephalic vesicles. These vesicles will form the **cerebrum**.
 - The metencephalon also gives rise to out pocketing from which **cerebellum** arises.

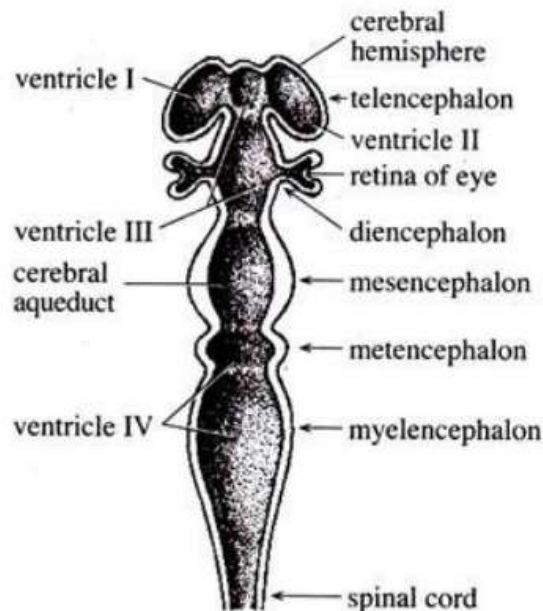
These out pocketings are accompanied by continued cell multiplication and will generate a variety of fold.



embryo with 14 pairs of somites. (E) Lateral view of brain of chick embryo about 75 to 80 hours of incubation. (F) Lateral view showing the flexures.

F. Cavities of the brain in chick

- The brain as well as the spinal cord are hollow structures and the cavity is generally called the neural cavity or neurocoel. The neurocoel are fluid filled cavity.
- The cavities of the telencephalic vesicles extend into the cerebral lobes and are known as the **first and second ventricles**.
- The cavity of diencephalon is called the **third ventricle**.
- The cavity of mesencephalon is designated as the **cerebral aqueduct or aqueduct of Sylvius**. It is greatly reduced in chick.
- The cavity of the rhombencephalon is termed as the **fourth ventricle**.



- In the 3rd and 4th ventricles blood vessels enter and form anterior and posterior choroid plexus respectively . These plexus secrete CSF (cerebrospinal fluid) that bathes the tissues of the brain and spinal cord.

