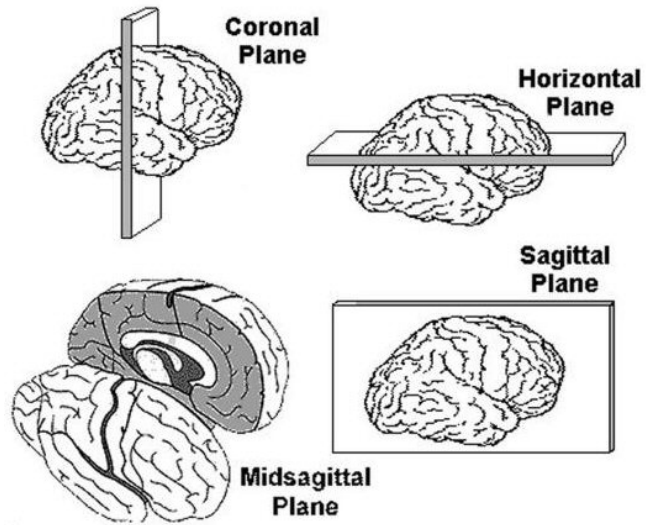


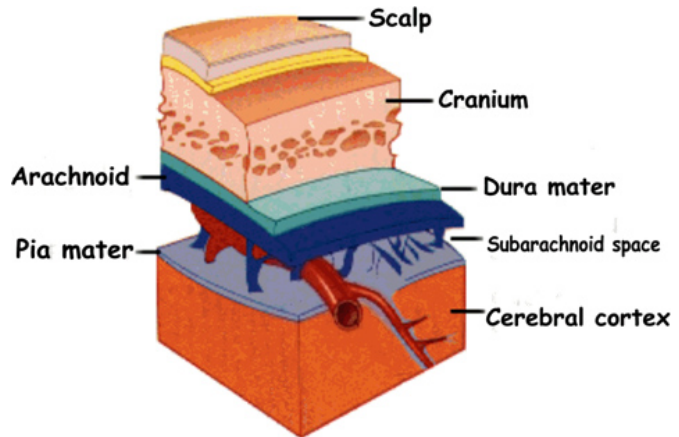
# Essentials of brain anatomy

There are three ways we can section the brain: the coronal, horizontal and sagittal planes.

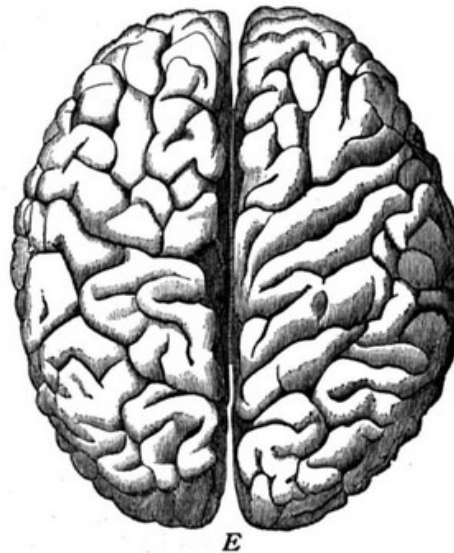


Under the scalp and cranium, we find the three maters (Latin: mother):

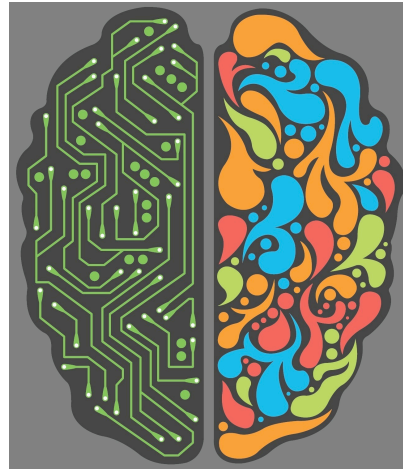
- dura (hard)
- pia (tender)
- arachnoid (spiderlike)



The brain is symmetrical about the midsagittal plane.

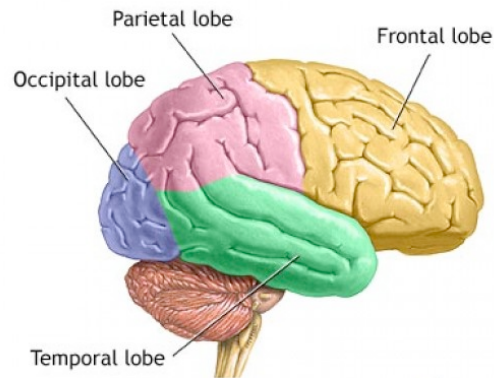


Its left and right hemispheres are often assigned logical and creative functions respectively, but this is a sweeping generalisation and must be treated with caution.



The brain has four lobes.

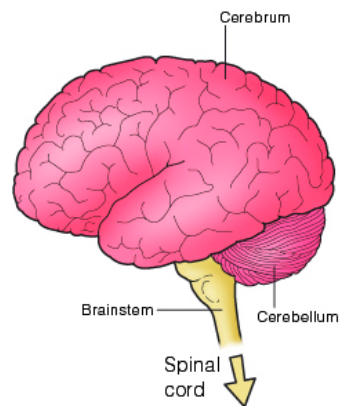
It can be drawn facing either towards the right (here)...



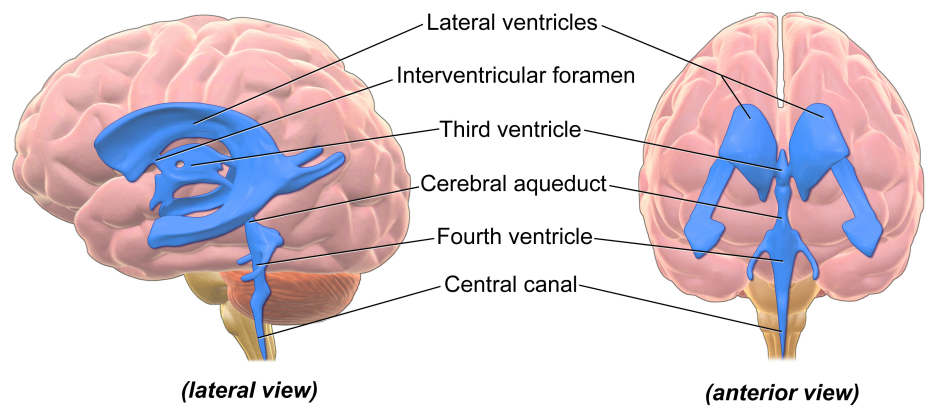
...or towards the left (here).

The brain can be divided into the cerebrum (Latin: brain) and the cerebellum (Latin: little brain).

The cerebellum, which is usually obvious, is at the back.

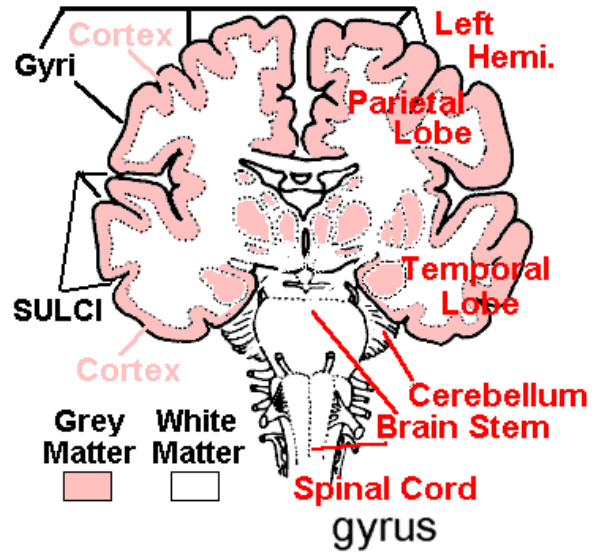


The brain contains several ventricles which store cerebrospinal fluid (CSF).

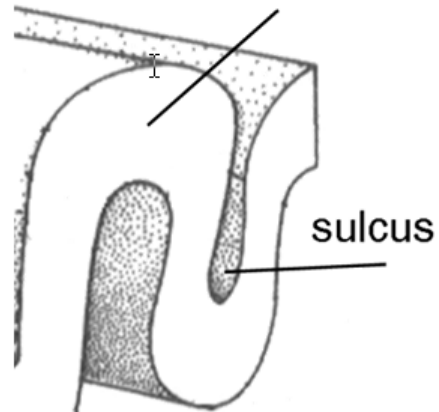




The grey matter lies on the surface of the cerebral cortex, with the white matter beneath



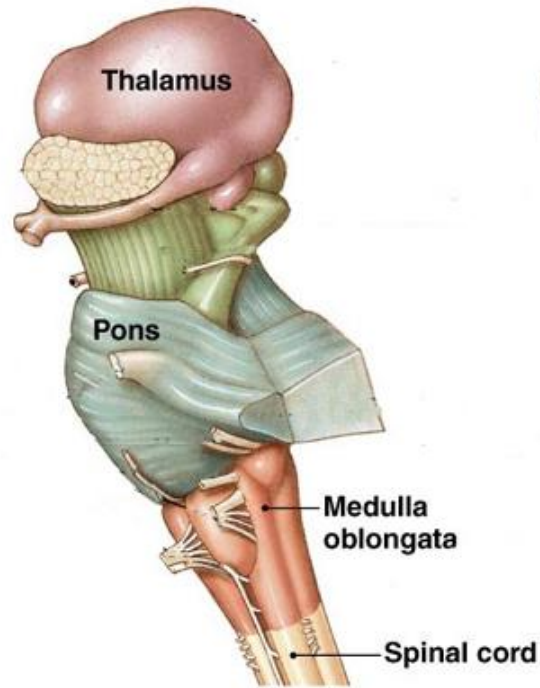
On the cortical surface we see gyri (ridges) and sulci (furrows).



The cerebral cortex (shaded in purple) is the outer layer of the cerebrum.

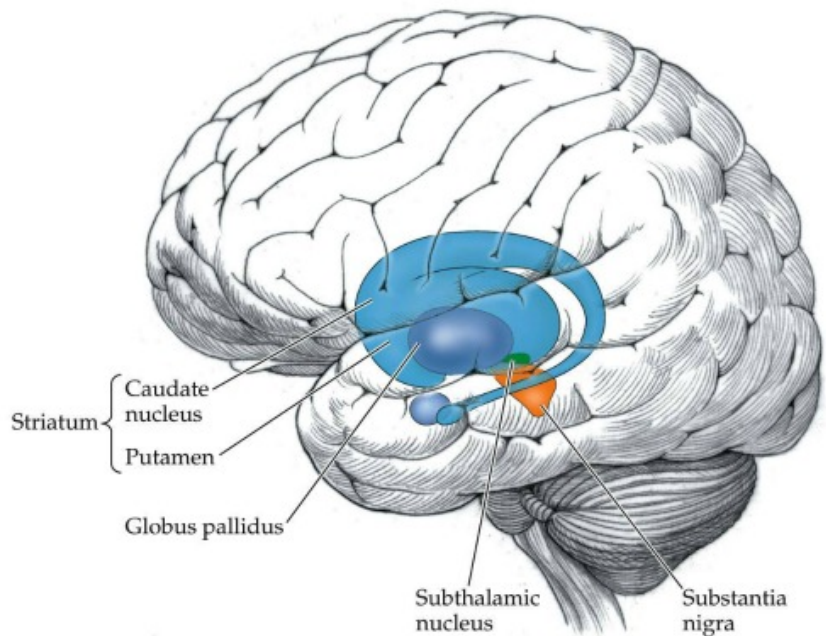


The pons (Latin: bridge) and medulla (Latin: marrow) are parts of the brainstem.

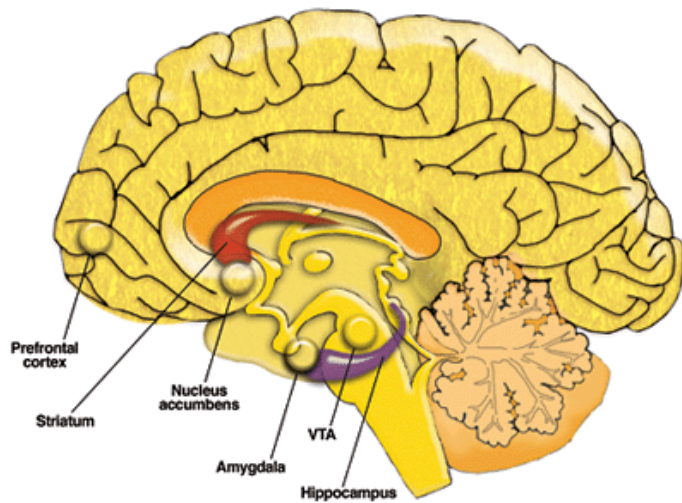


The basal ganglia (bundles) comprise the striatum (caudate nucleus and putamen), the globus pallidus, the substantia nigra, the nucleus accumbens, and the subthalamic nucleus.

"Striatum" comes from the obsolete term corpus striatum (Latin: striped body).



Another view including the nucleus accumbens and the VTA (ventral tegmental area)

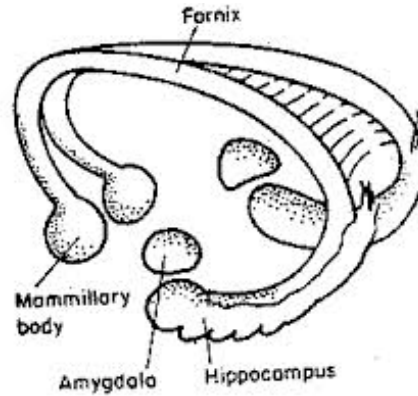
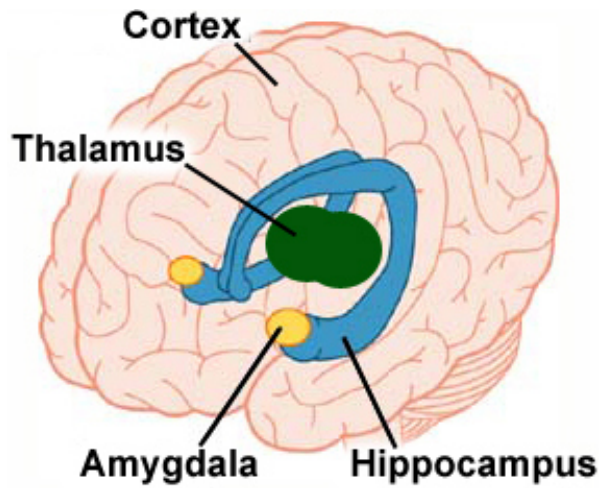


The thalamus (Greek, chamber) lies on the midline between the cerebral cortex and the midbrain (mesencephalon). Its two halves surround the third ventricle.

There are two hippocampi (Greek: seahorse) and two amygdalae (Greek: almond, tonsil).

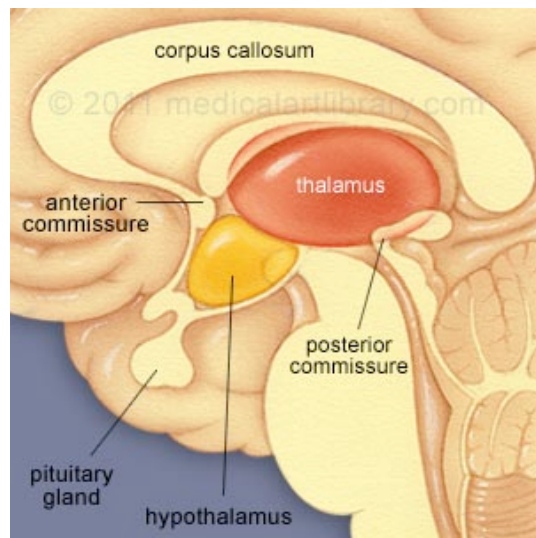
The fornix (Latin: arch) connects the hippocampus to the mamillary bodies.

Left is front here.



The pituitary gland is an endocrine gland secreting a wide range of hormones. It lies next to the hypothalamus (Greek, under chamber).

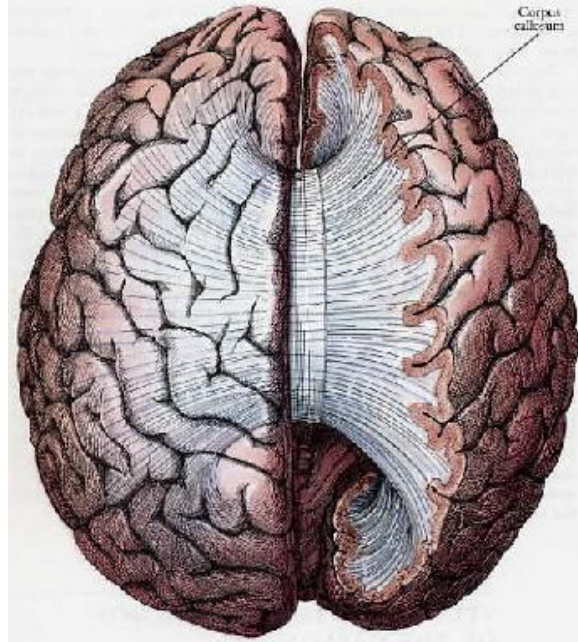
The anterior and posterior commissures connect the left and right hemispheres.





The corpus callosum, containing over 200 million axons, fans out into each hemisphere.

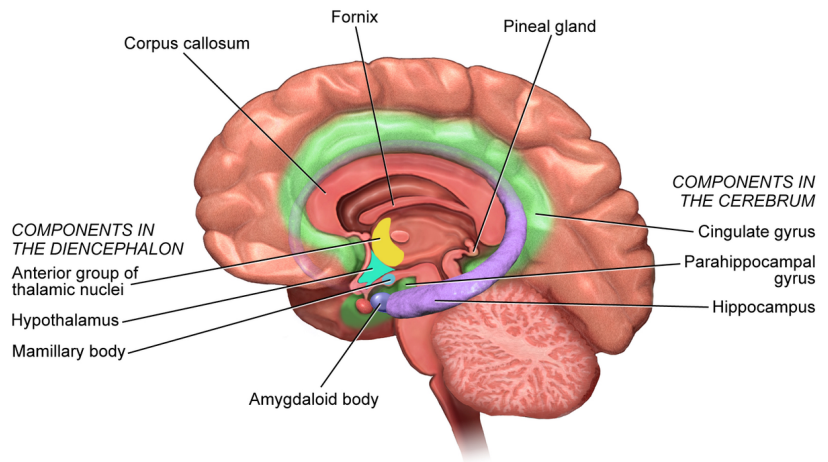
It is the largest tract of neurons in the nervous system.



The limbic system, or paleomammalian brain, is located on either side of the thalamus (under the cerebrum).

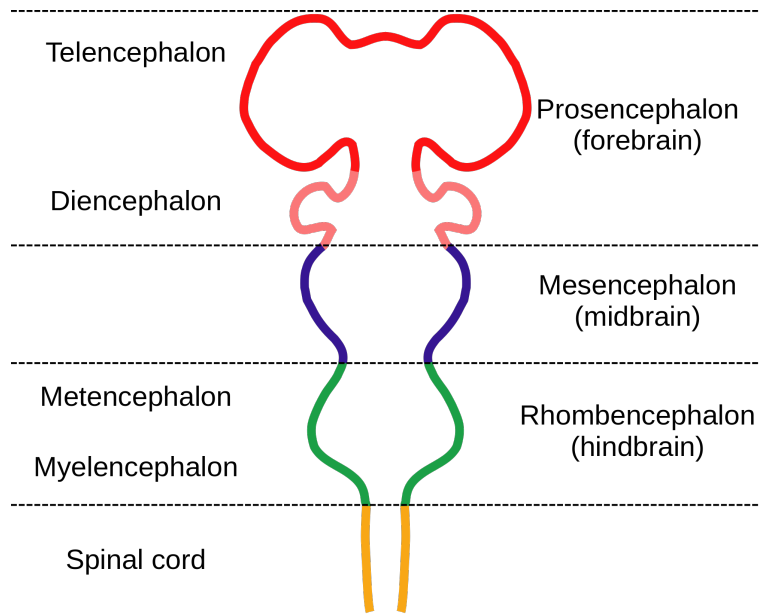
The term originated in the 1940s and is grounded in out-of-date concepts of brain anatomy.

### The Limbic System



A better way of categorising the brain is due to the layout of the embryo's neural tube.

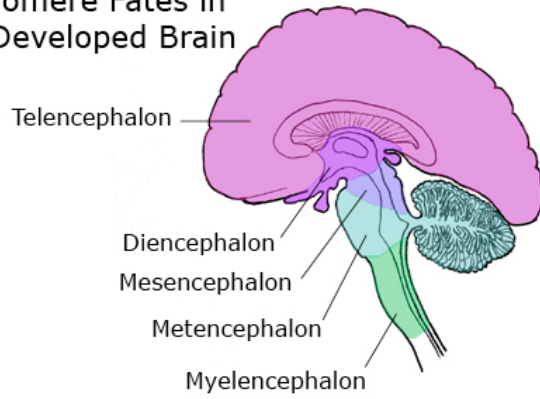
A human embryo at 5 to 8 weeks is shown.



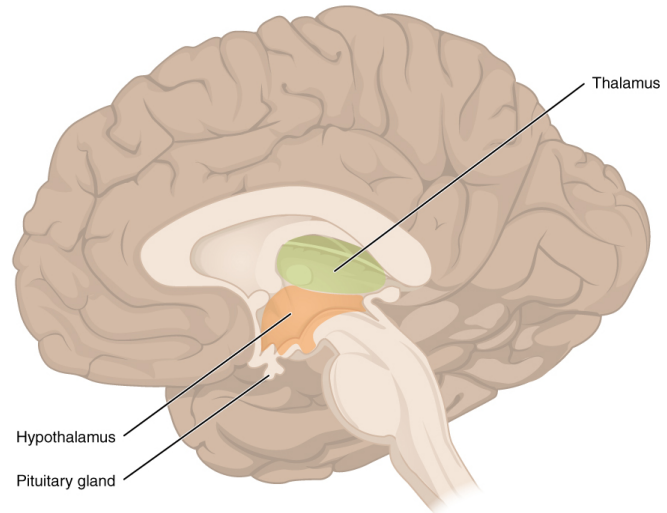


This is where parts of the neural tube (neuromeres) end up in the adult.

### Neuromere Fates in the Developed Brain

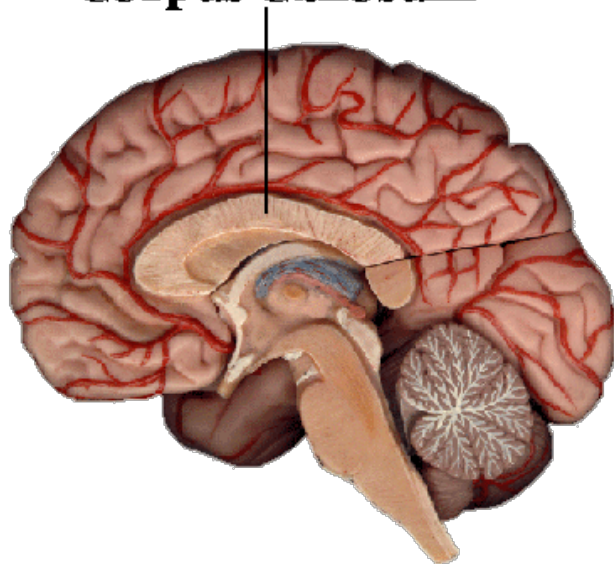


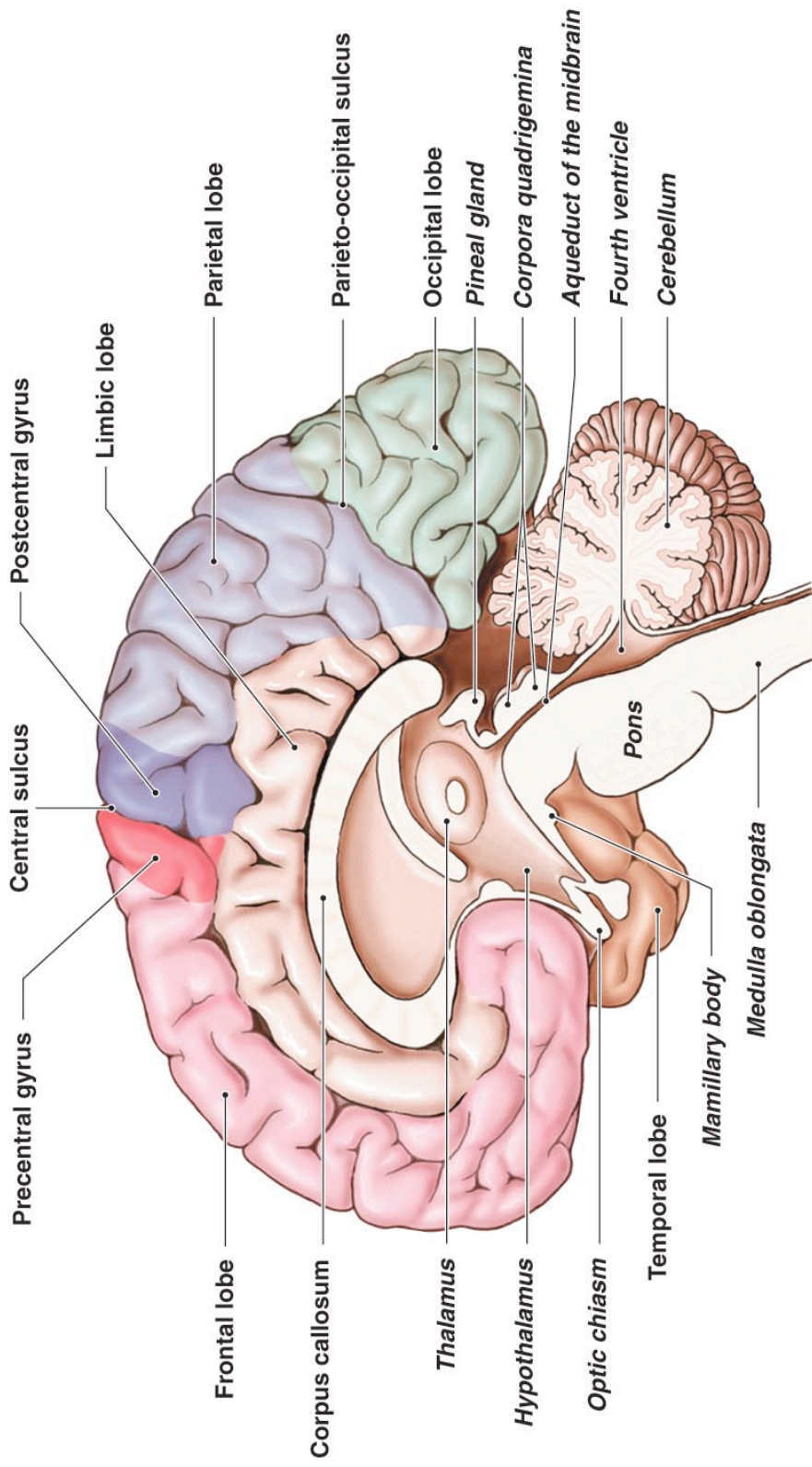
The diencephalon comprises the thalamus, hypothalamus and pituitary gland.

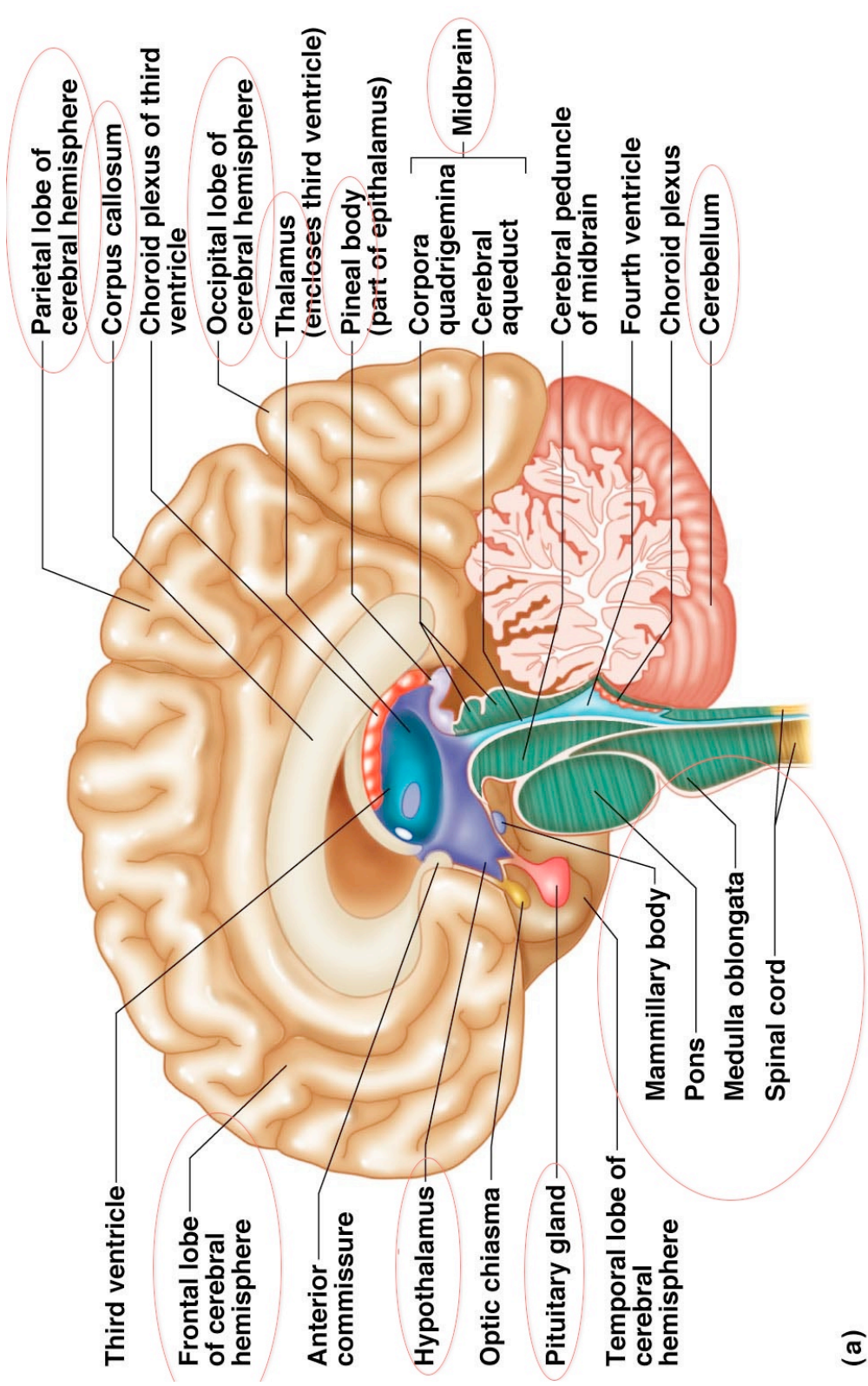


The corpus callosum (Latin: tough body), the largest white matter structure in the brain, connects the left and right hemispheres.

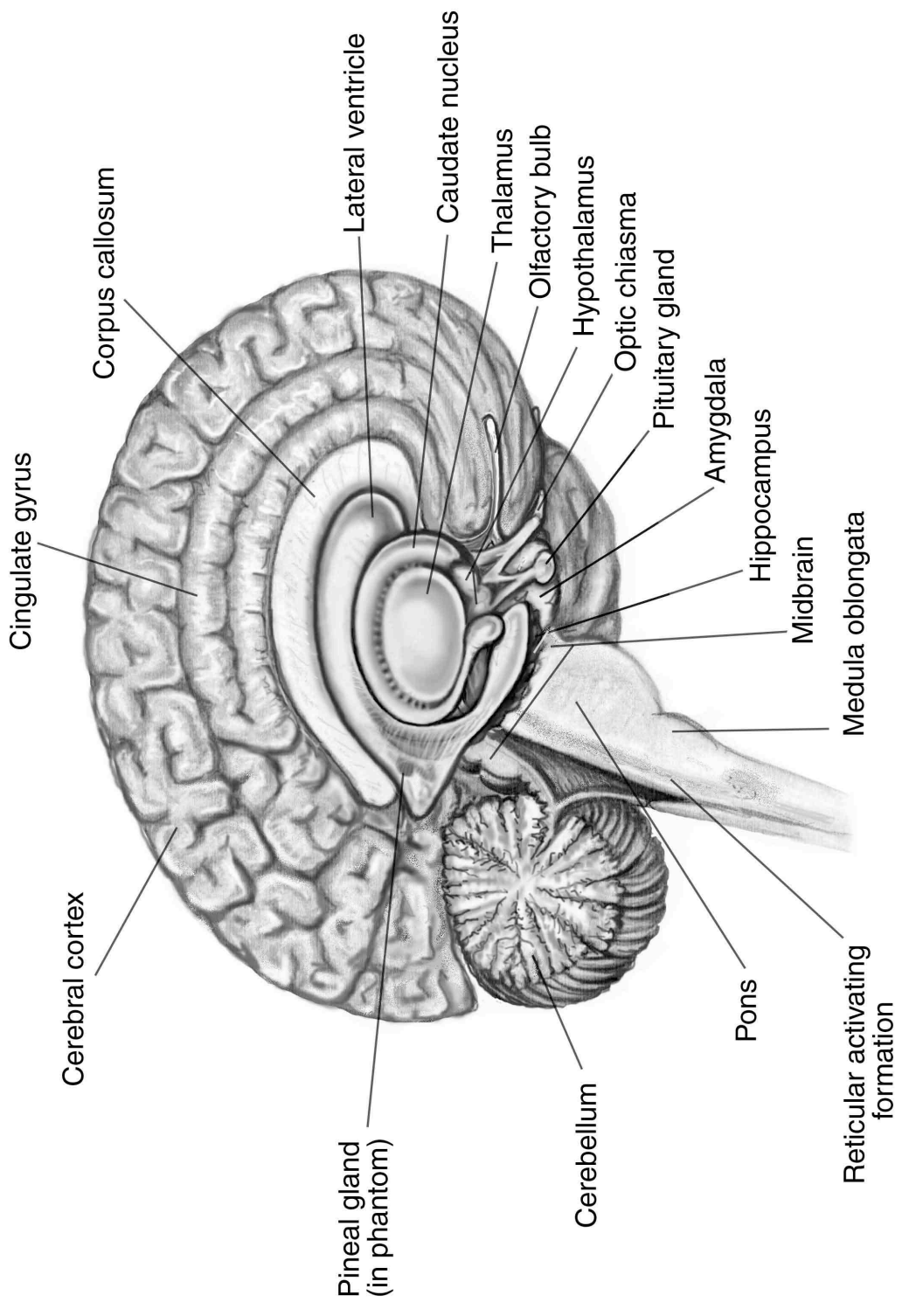
### Corpus Callosum



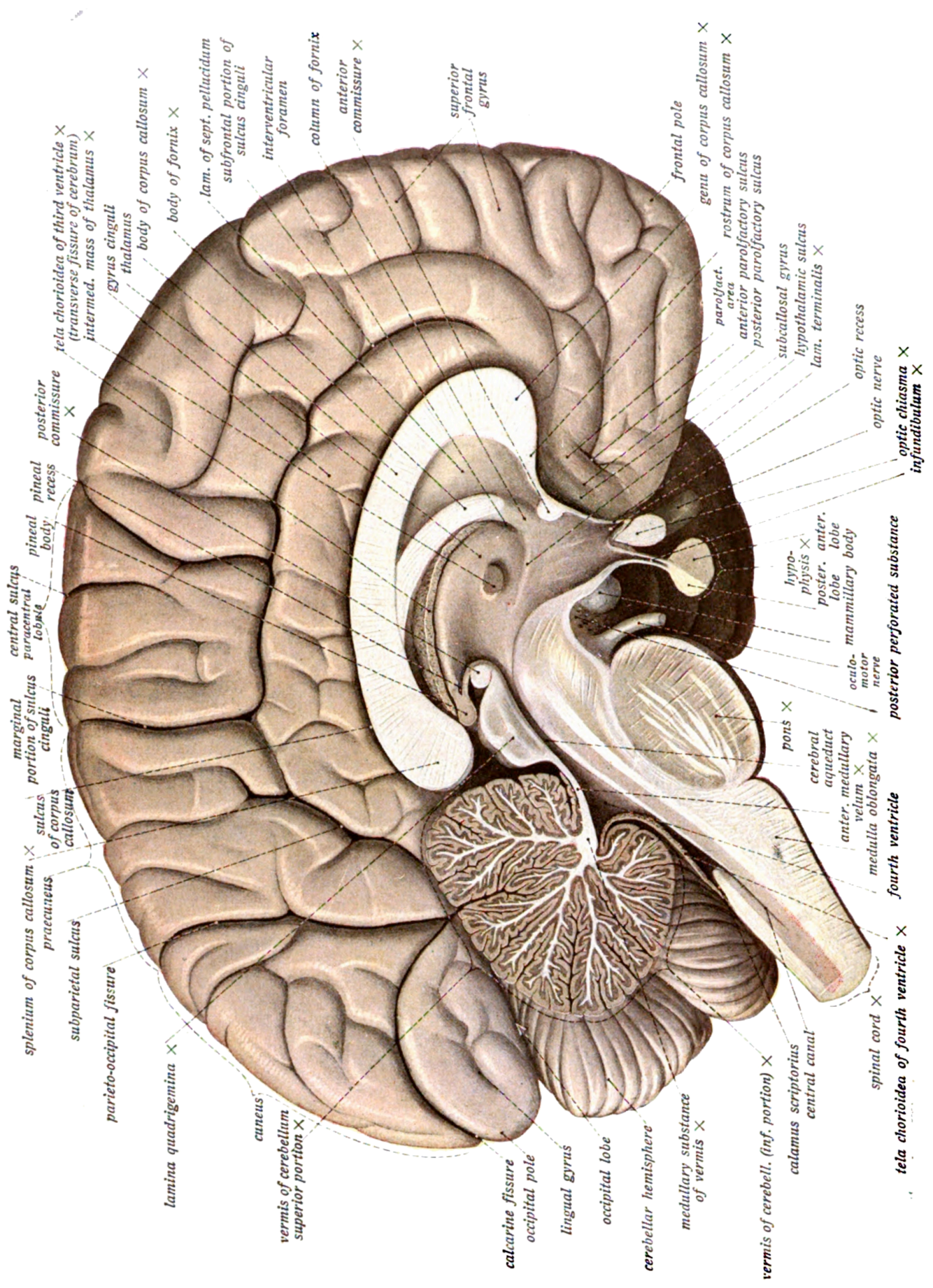




(a)



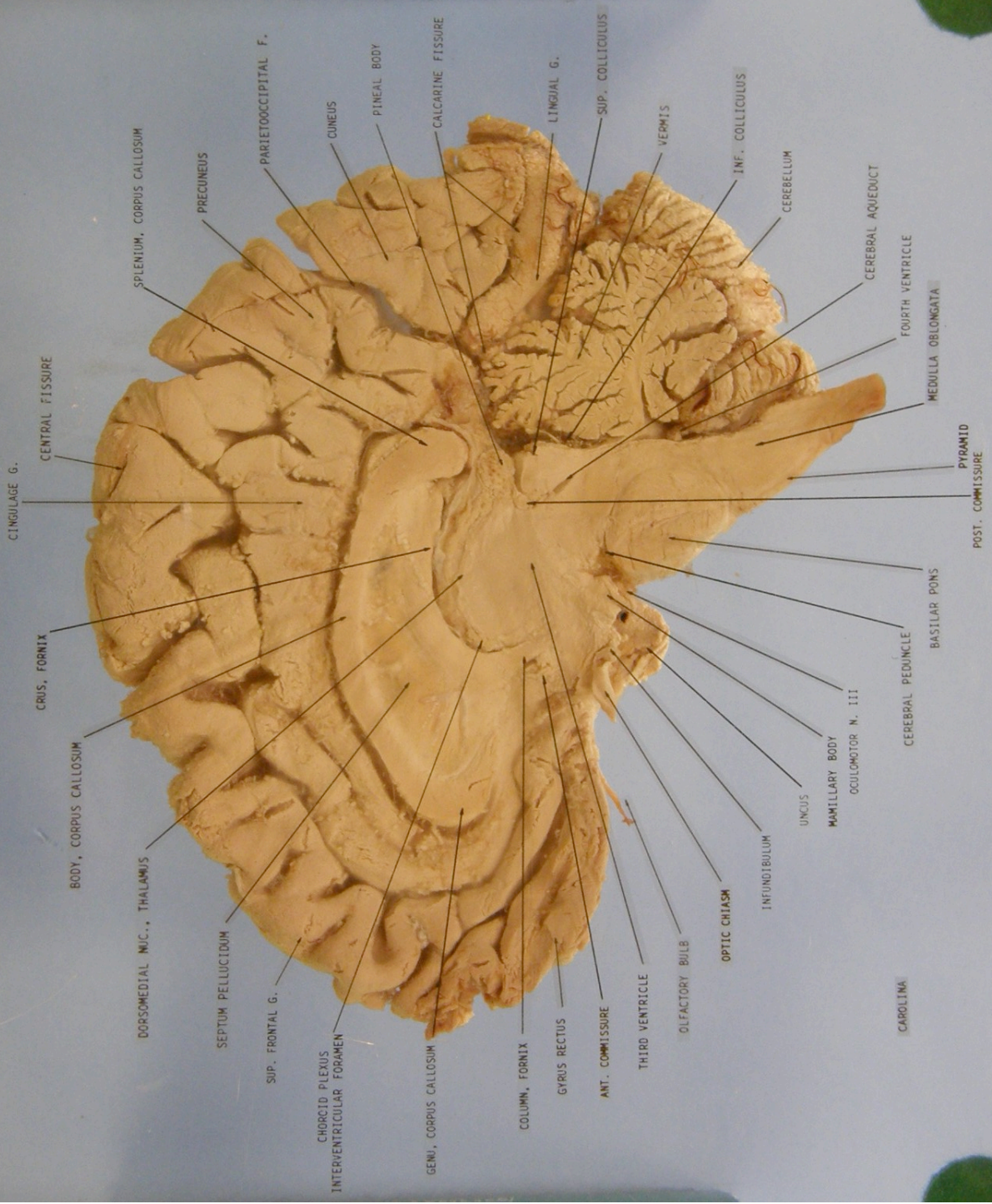




- central sulcus
- paracentral lobule
- marginal sulcus
- portion of sulcus cinguli
- sulcus of corpus callosum
- splenium of corpus callosum
- praeuncus
- subparietal sulcus
- parieto-occipital fissure
- lamina quadrigemina
- cuneus
- vermis of cerebellum superior portion
- calcarine fissure
- occipital pole
- lingual gyrus
- occipital lobe
- cerebellar hemisphere
- medullary substance of vermis
- vermis of cerebell. (inf. portion)
- calamus scriptorius central canal
- spinal cord
- tela chorioidea of fourth ventricle
- fourth ventricle
- medulla oblongata
- anterior medullary velum
- cerebral aqueduct
- pons
- oculo-mammillary nerve
- posterior perforated substance
- hypophysis poster. lobe
- mammillary body
- optic chiasma
- infundibulum
- optic nerve
- optic recess
- lam. terminalis
- hypothalamic sulcus
- subcallosal gyrus
- posterior parolfactory sulcus
- anterior parolfactory sulcus
- parolfact. area
- rostrum of corpus callosum
- genu of corpus callosum
- frontal pole
- anterior commissure
- column of fornix
- interventricular foramen
- lam. of sept. pellucidum
- subfrontal portion of sulcus cinguli
- body of fornix
- gyrus thalamus
- gyrus cinguli
- intermed. mass of thalamus
- tela chorioidea of third ventricle (transverse fissure of cerebrum)
- superior frontal gyrus

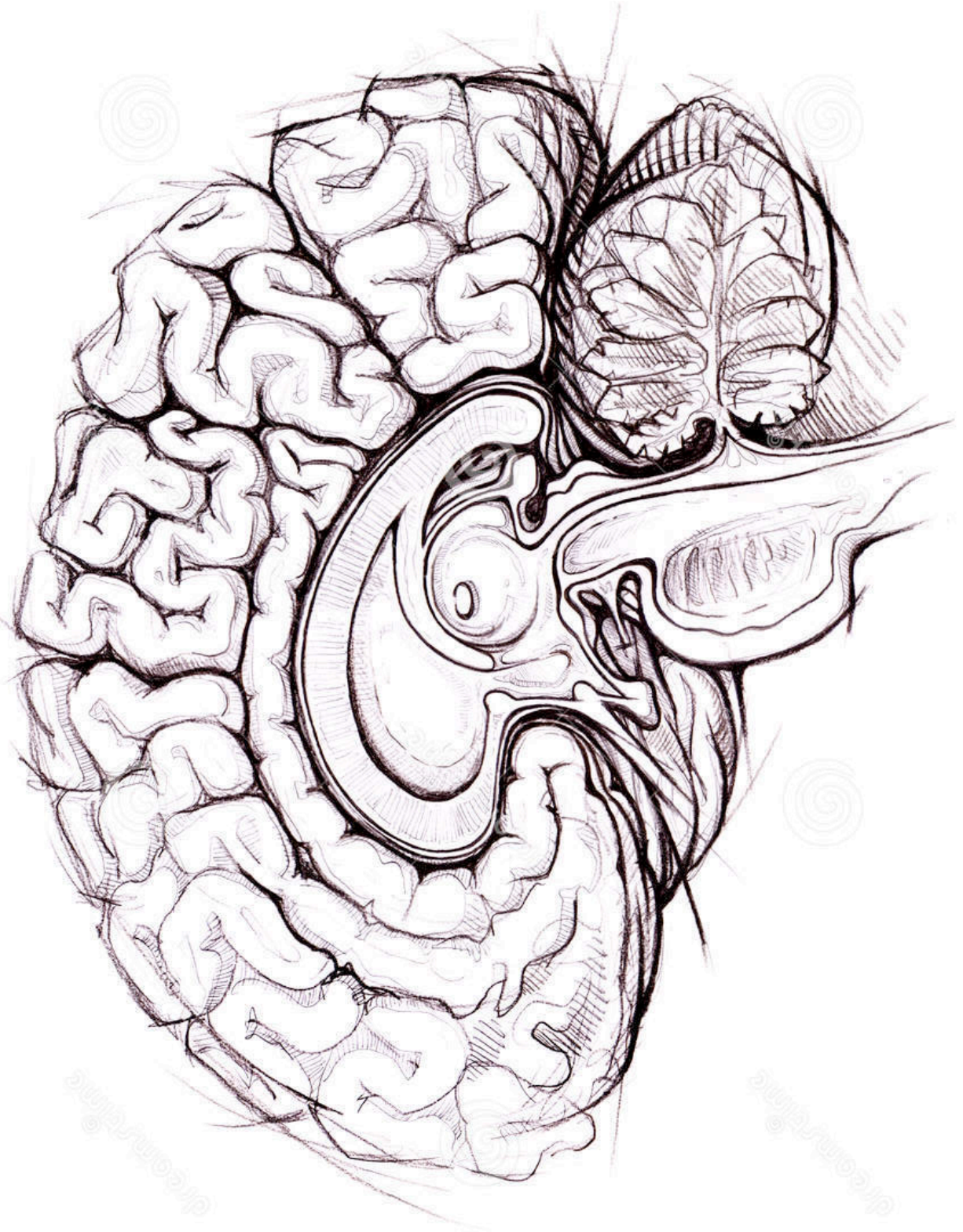


# HUMAN BRAIN: SAGITTAL SECTION





Now label this diagram yourself:



And finally a real specimen:

