

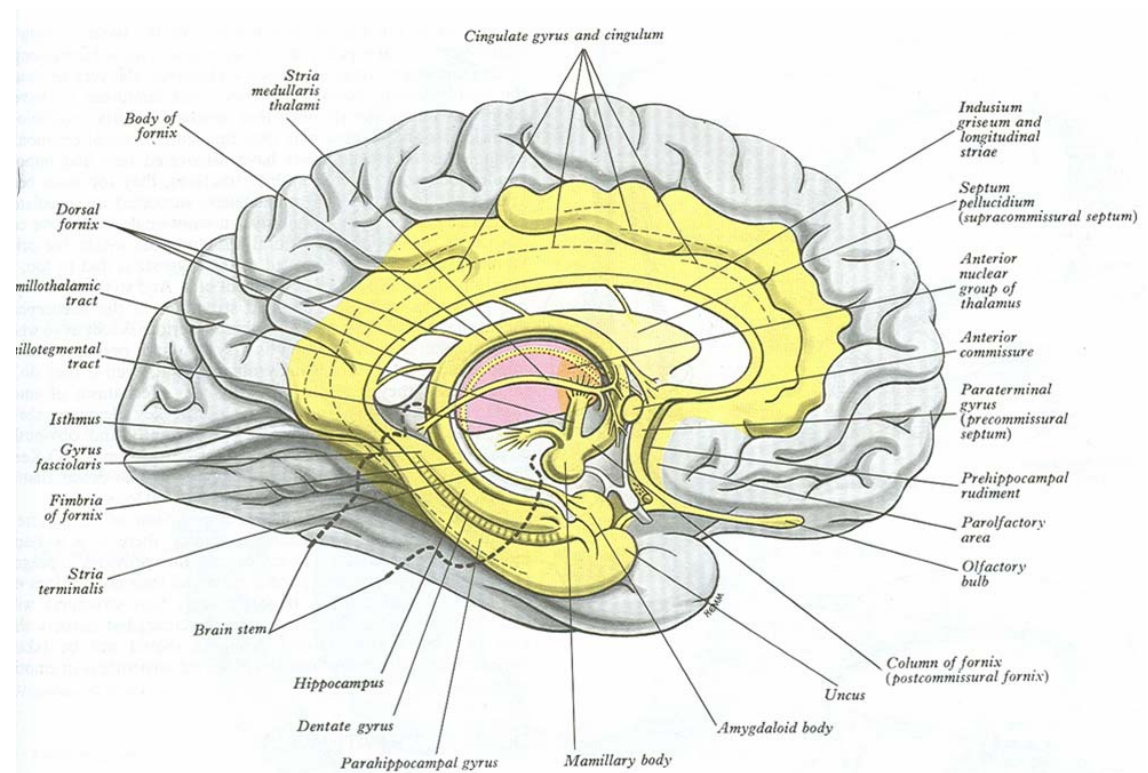
Limbic System

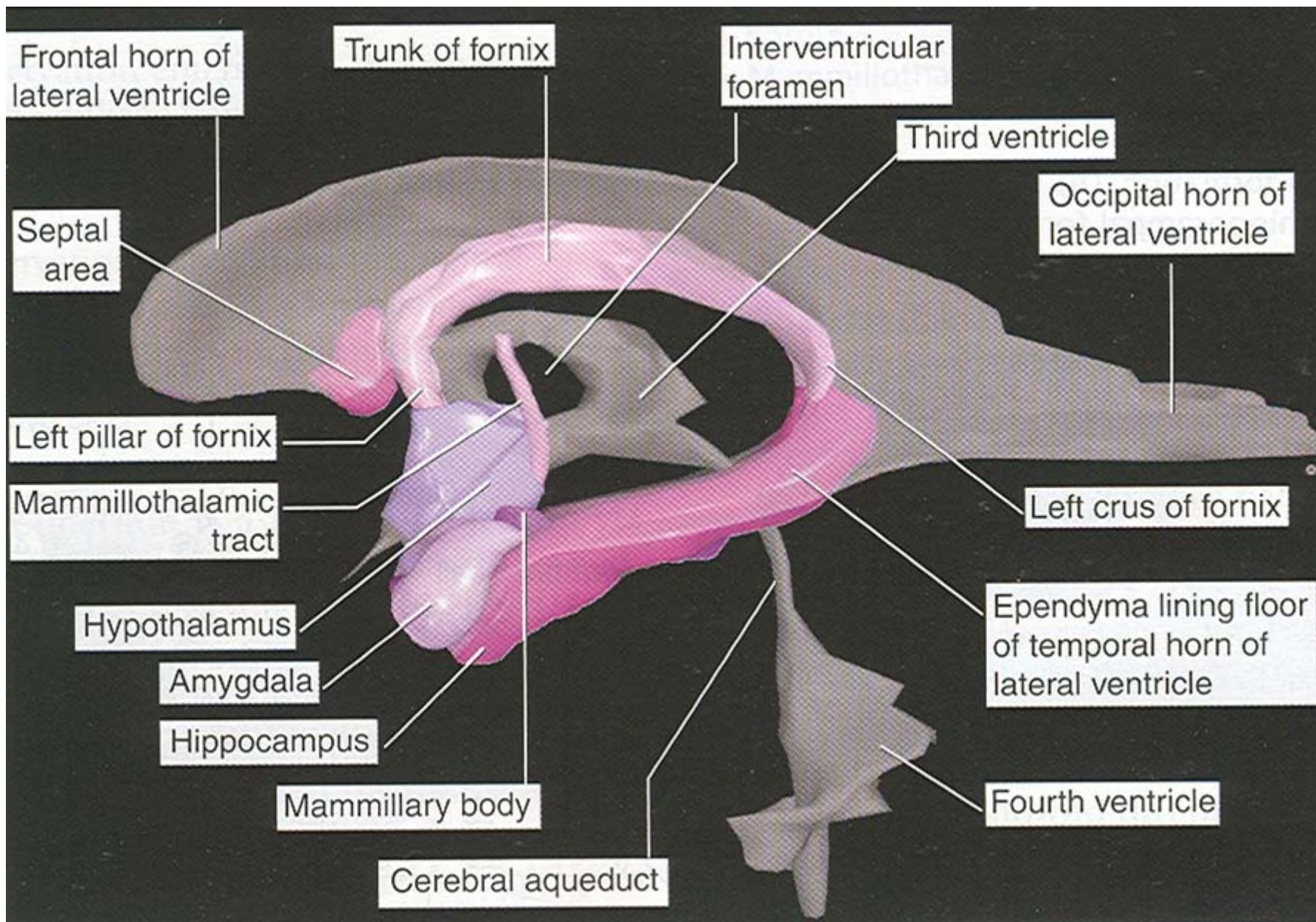
Limbic System

Parts of cortical , sub-cortical structures forming ring around upper end of brain stem

Plays vital role in

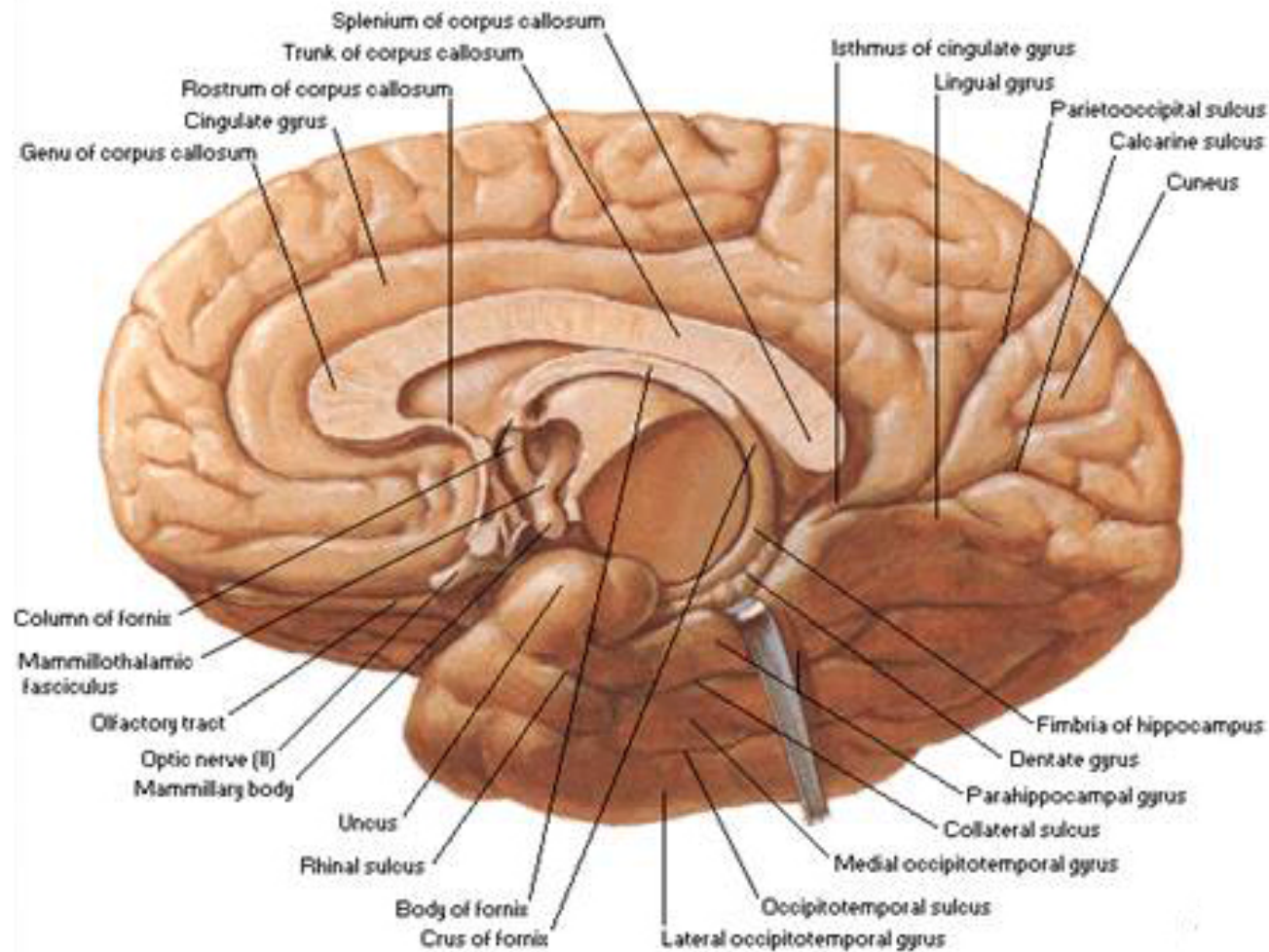
- Emotions
- Behaviour
- Drive-
- Memory





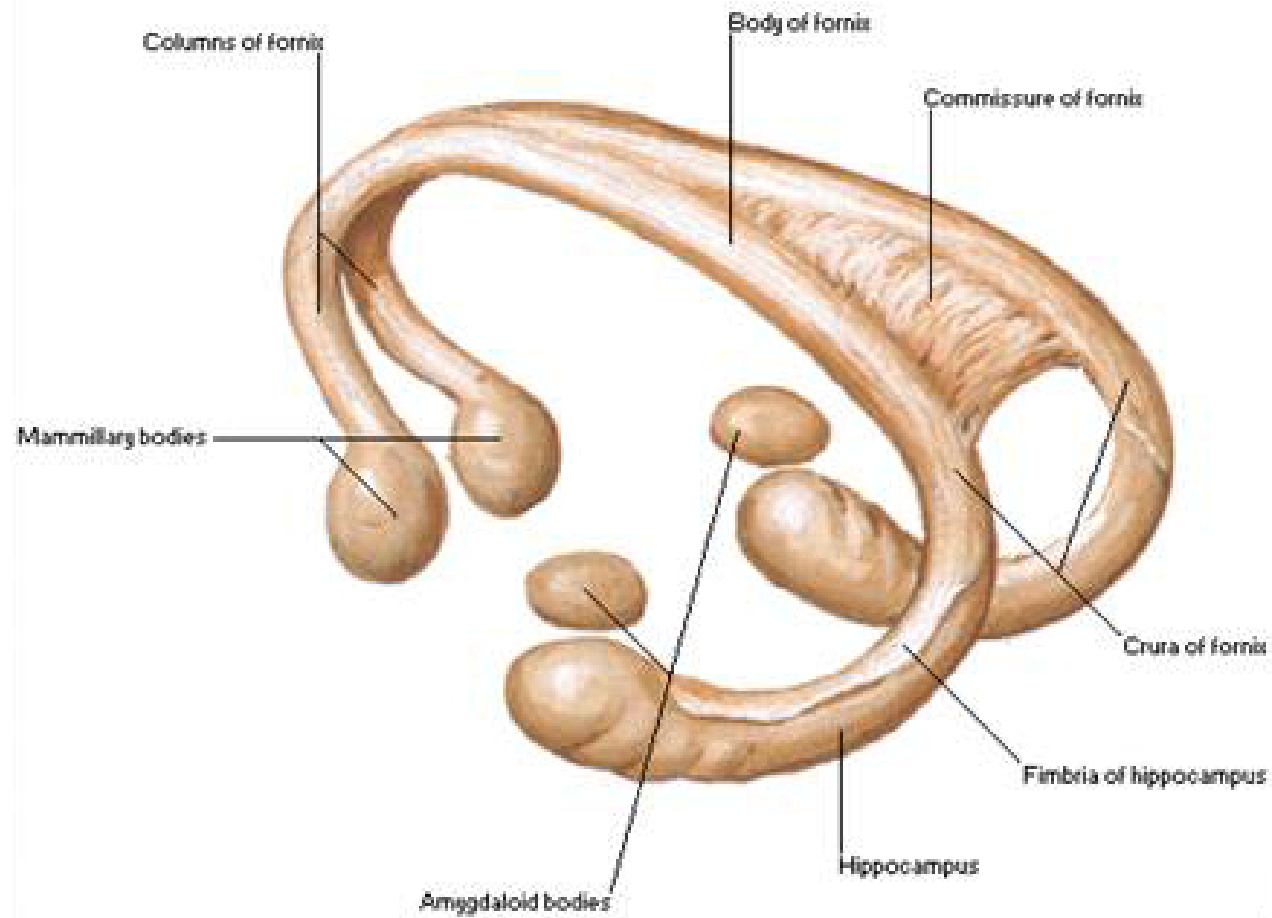
Cerebrum - Hemisphere with Brainstem Excised

Medial View



Hippocampus and Fornix

Schema of Fornix



Limbic System

Three main components

- Cortical structures
- Sub-cortical nuclei
- Fibre bundles

Limbic System

Cortical structures

Limbic lobe-

- Cingulate gyrus
- Isthmus
- Parahippocampal gyrus
- Uncus (ento rhinal cortex)

Hippocampal formation

- Hippocampus
- Dentate gyrus
- Indusium griseum

Limbic System

Subcortical nuclei

- Amygdaloid nuclear complex – somatic response to internal needs , fear , drive/instincts (smell mediated sexual behaviour)
- Septal region & nuclei (pleasure zone)
- Olfactory areas (olfactory nerve, tract , stria)
- Hypothalamus esp. mammillary bodies
- Anterior nucleus of thalamus

Limbic System

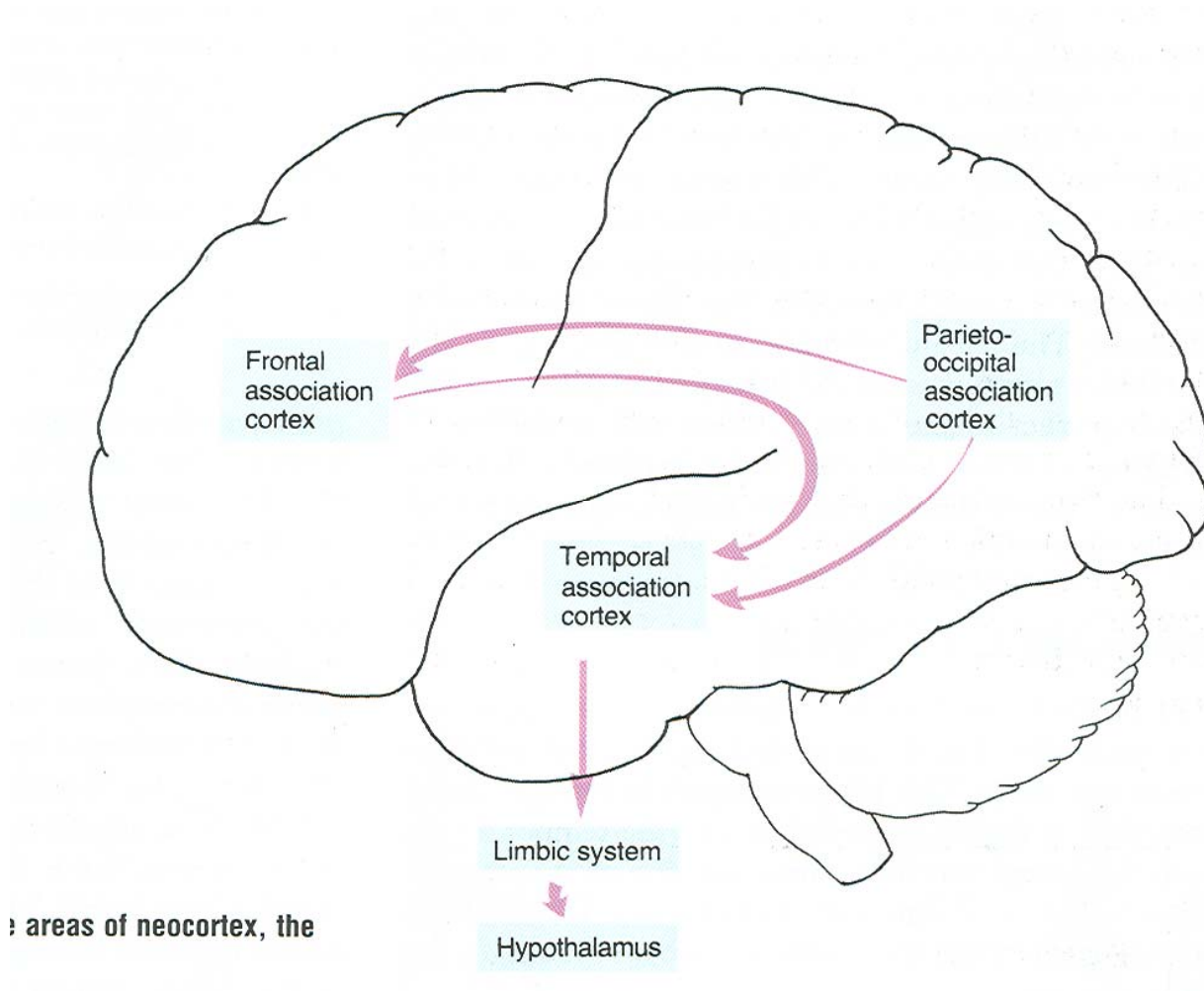
Fibre bundles

- Fornix
- Mammillothalamic tract
- Stria medullaris thalami
- Stria terminalis
- Anterior commissure
- Cingulum
- Diagonal band (broca)

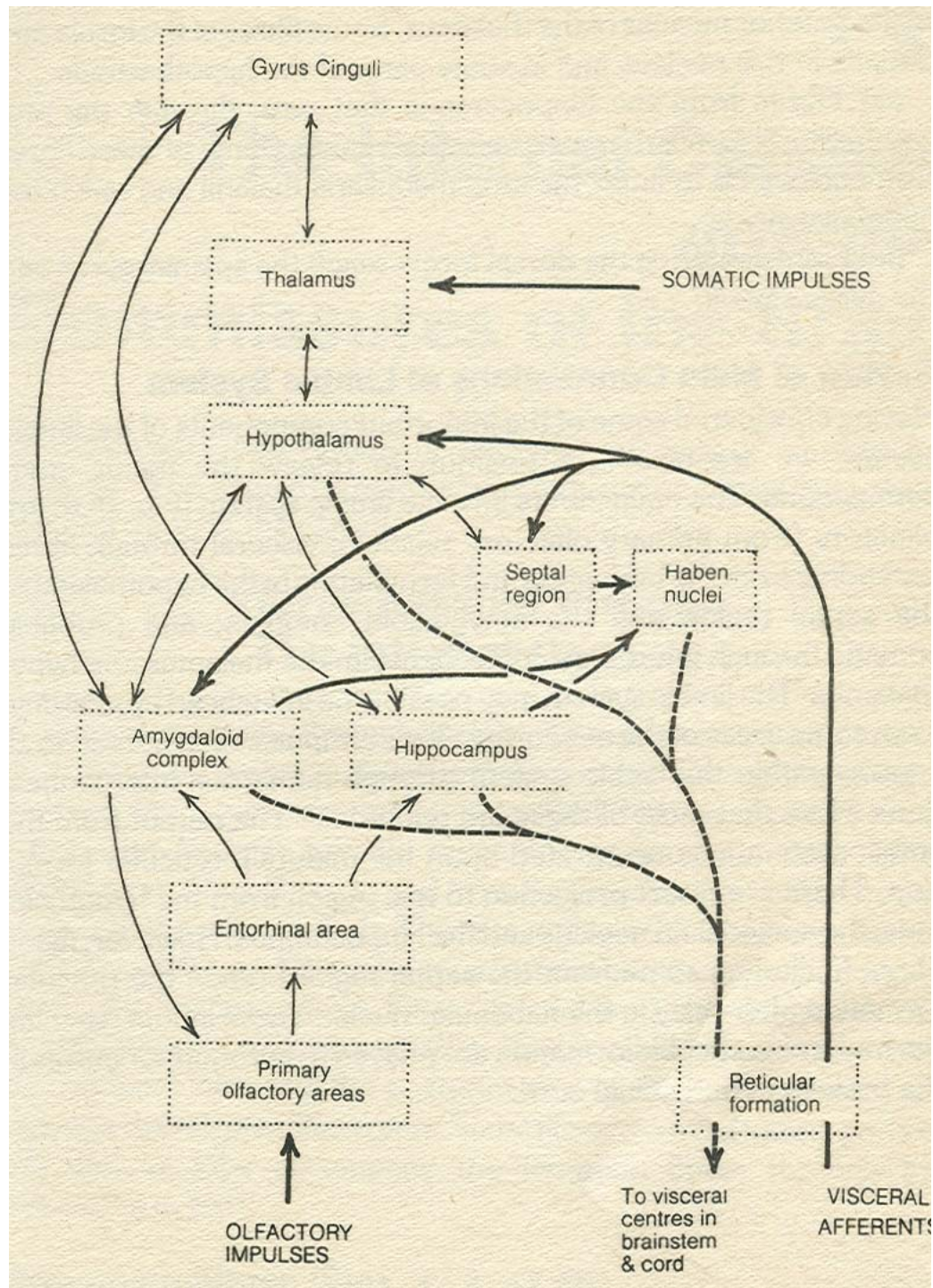
Limbic System

Functions

- Integration of olfactory, visceral and somatic impulses
- Hunger, food and eating behaviour
- Sexual behaviour
- Emotional behaviour (cingulate gyrus)
- Recent memory (hippocampus)
- Perception of fear (amygdaloid)
- Drug dependence (septal nucleus)



Vision
Hearing
Touch



Main Inputs

- Olfactory
- Visceral
- Somatic

Output

Midbrain

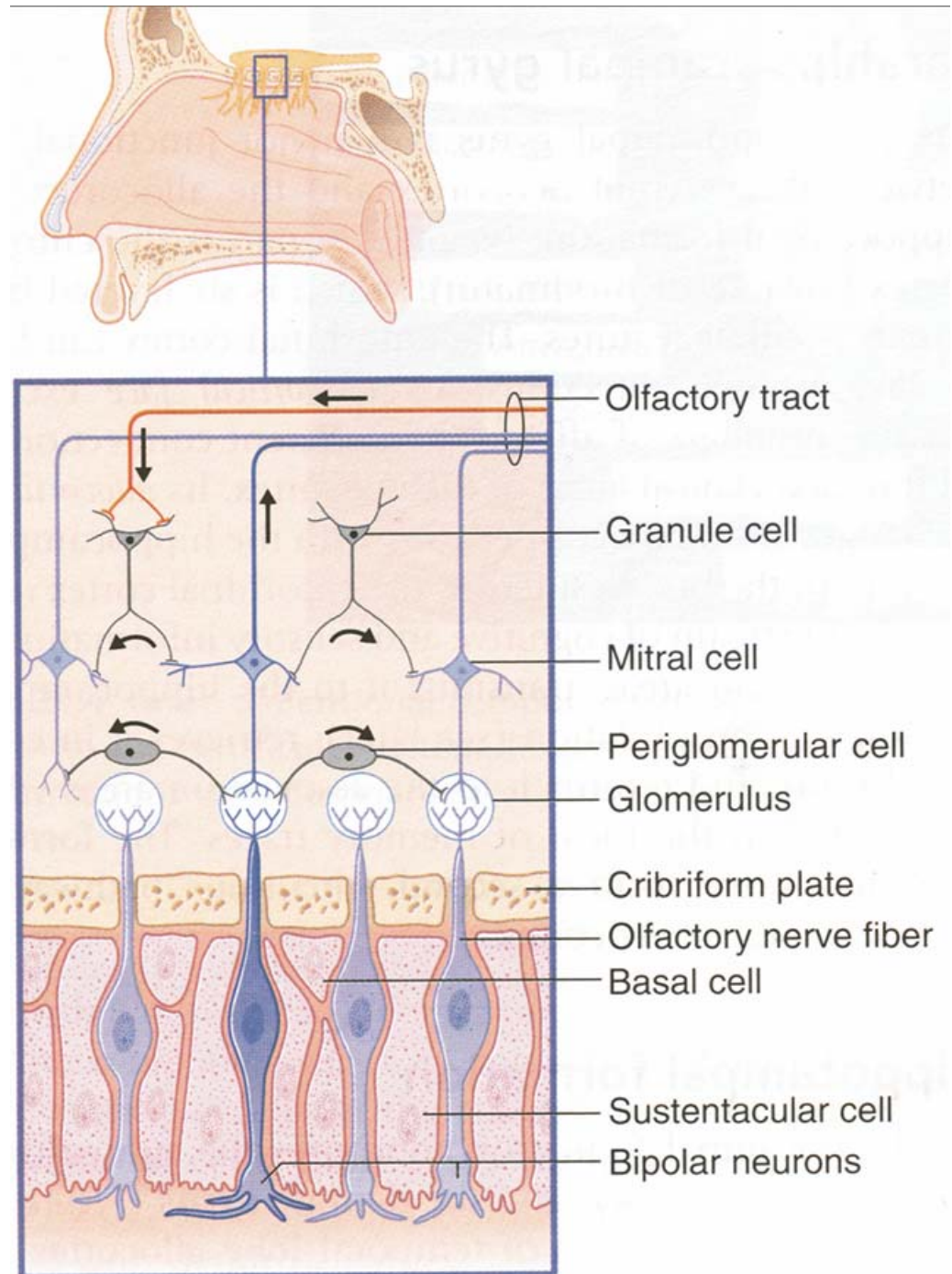
Reticular formation



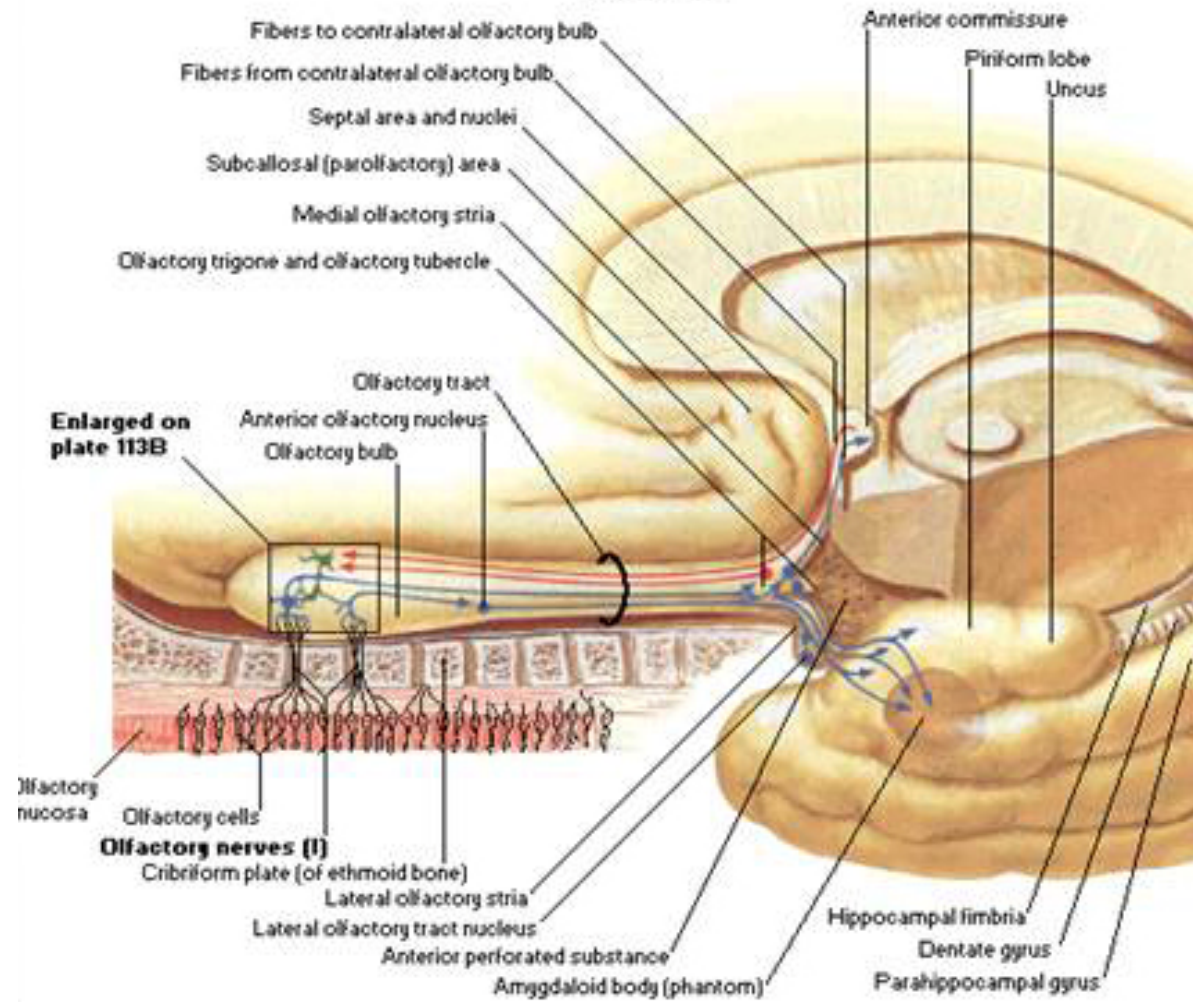
Autonomic centers in
Brain stem & spinal cord

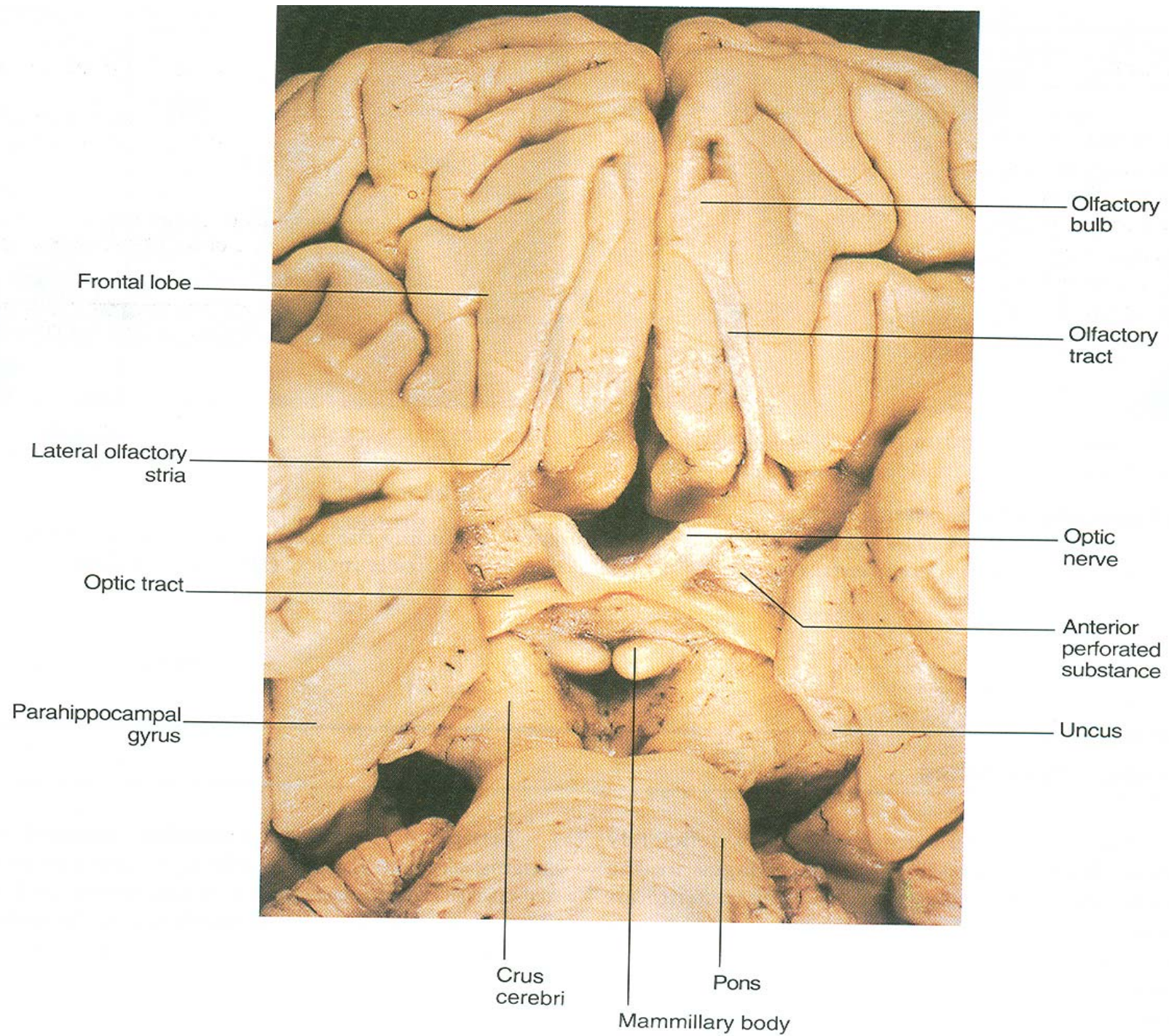
OLFACTORY SYSTEM

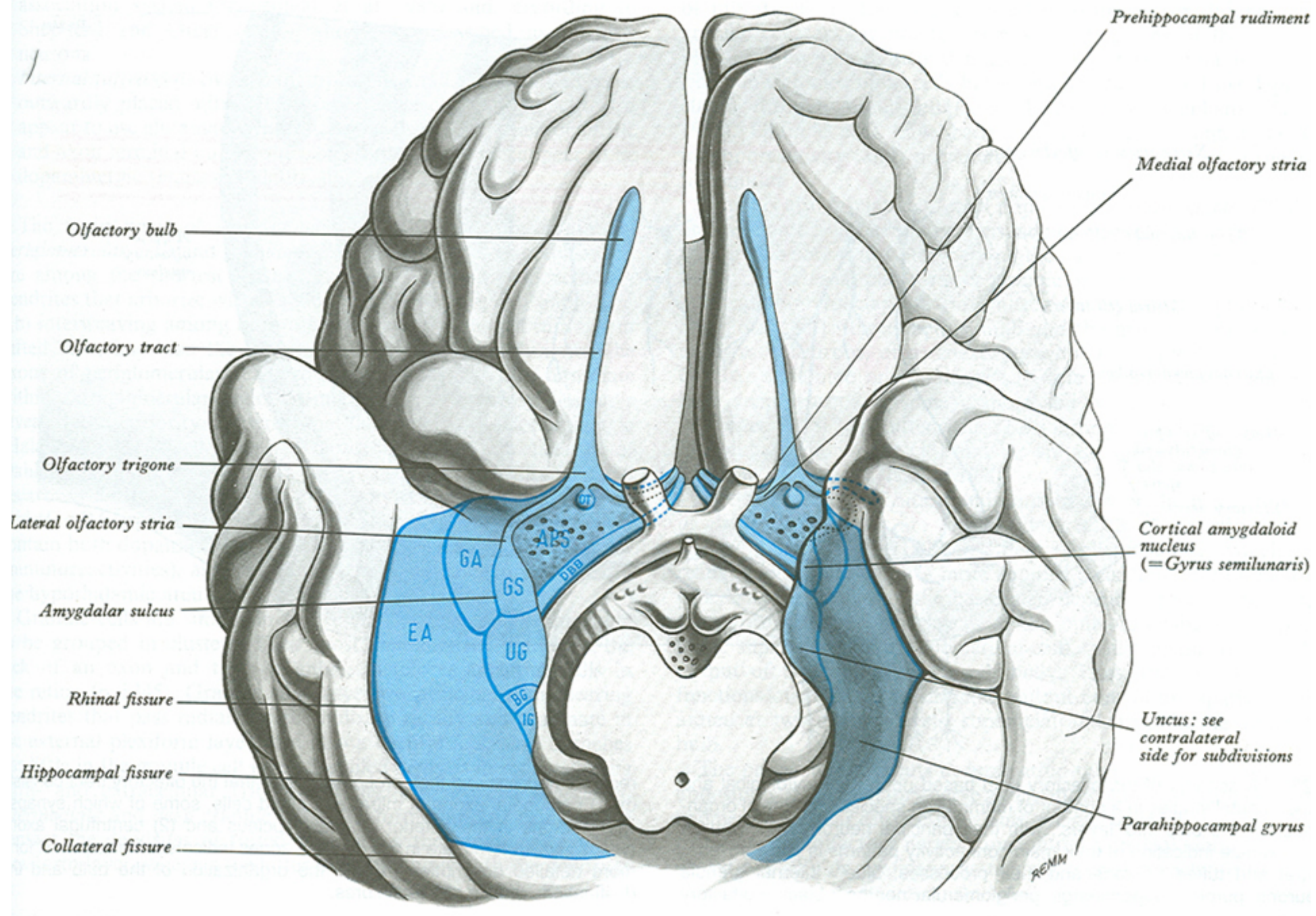
1. Cell bodies are located in surface epithelium.
2. Axons of primary afferents enter cerebral cortex directly.
3. Primary neurons are replaced continuously.
4. Olfactory pathway is ipsilateral.



Olfactory Nerve Schema







Medial stria



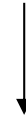
Paraterminal gyrus

- Lateral stria

Continue with gyrus
semilunaris(cortico-
median – Amygdaloid
body)



- Pyriform lobe(uncus
& ant. Part of
parahippocampal
gyrus



- Primary olfactory
cortex

Papez Circuit – for emotional integration & recent memory

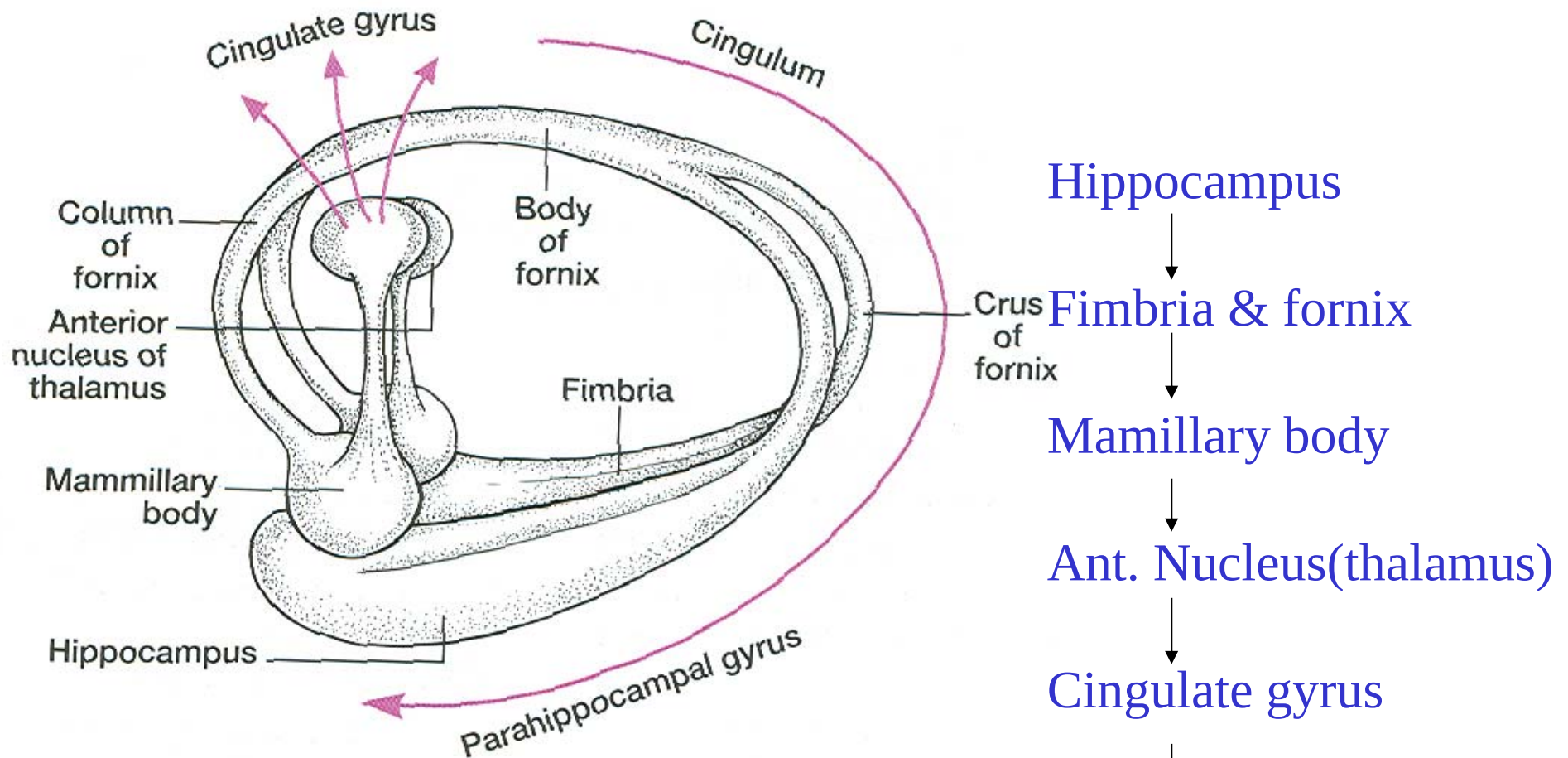


Fig. 16.8 The interconnection of limbic structures which constitute the Papez circuit.

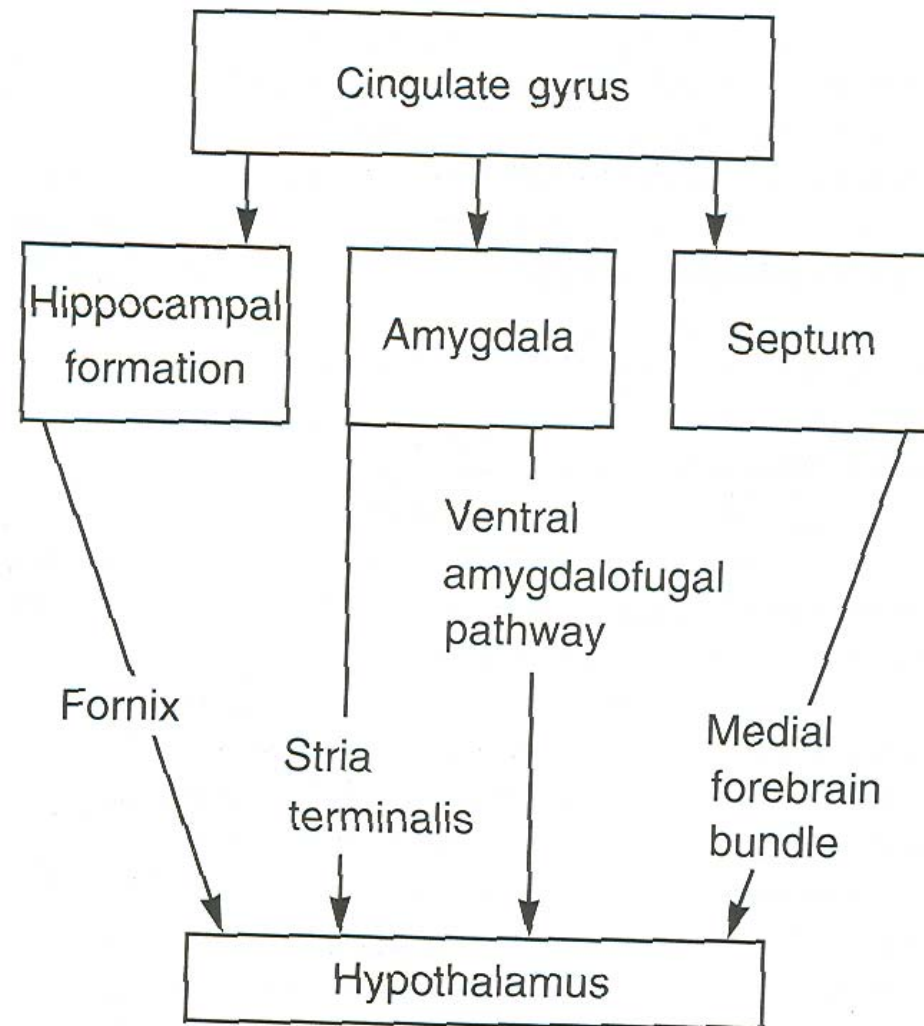


Fig. 16.4 The principal parts of the limbic system and their relationship with the hypothalamus.

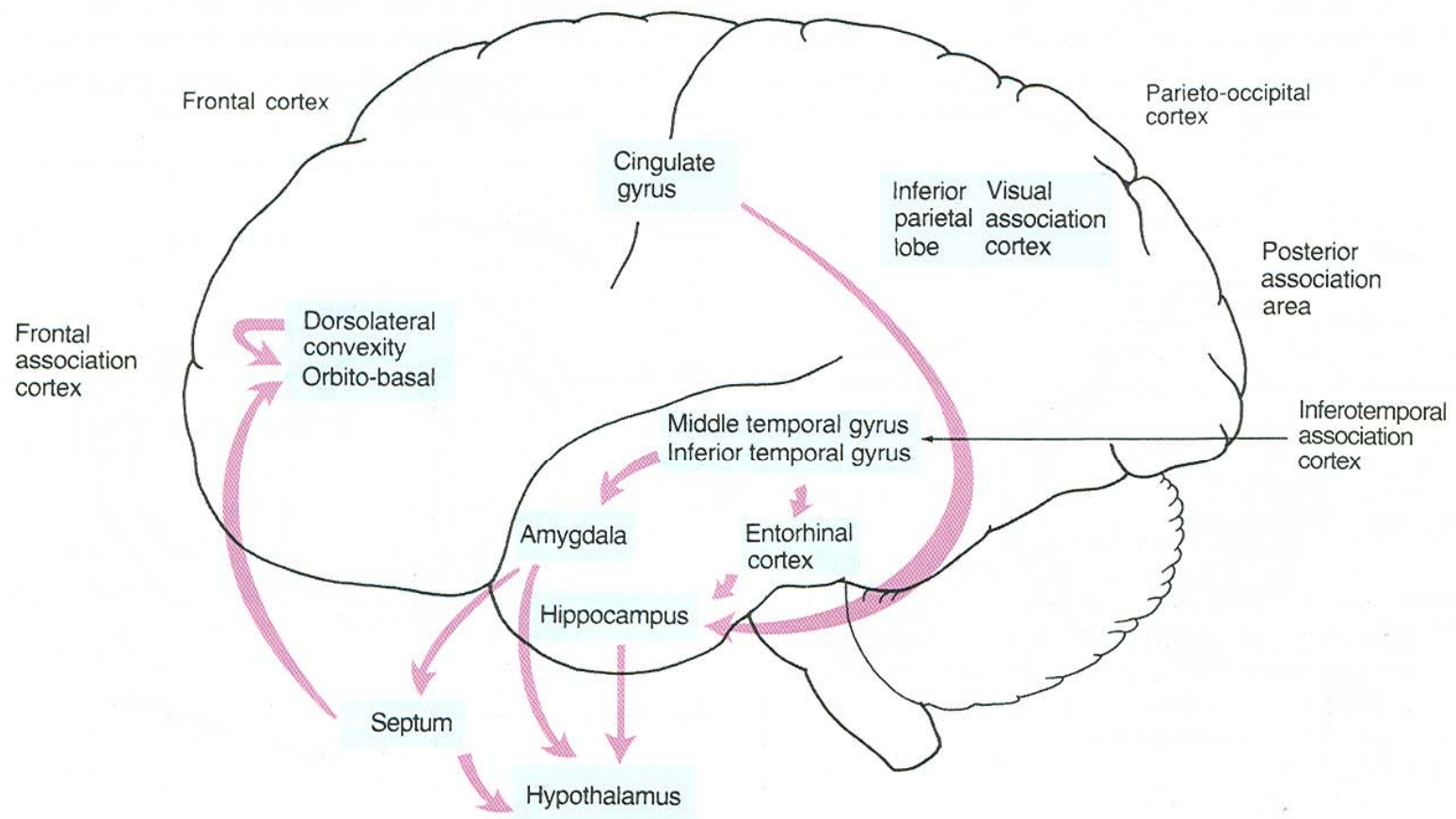


Fig. 16.6 The interconnections between associative neocortical regions and the component parts of the limbic system.

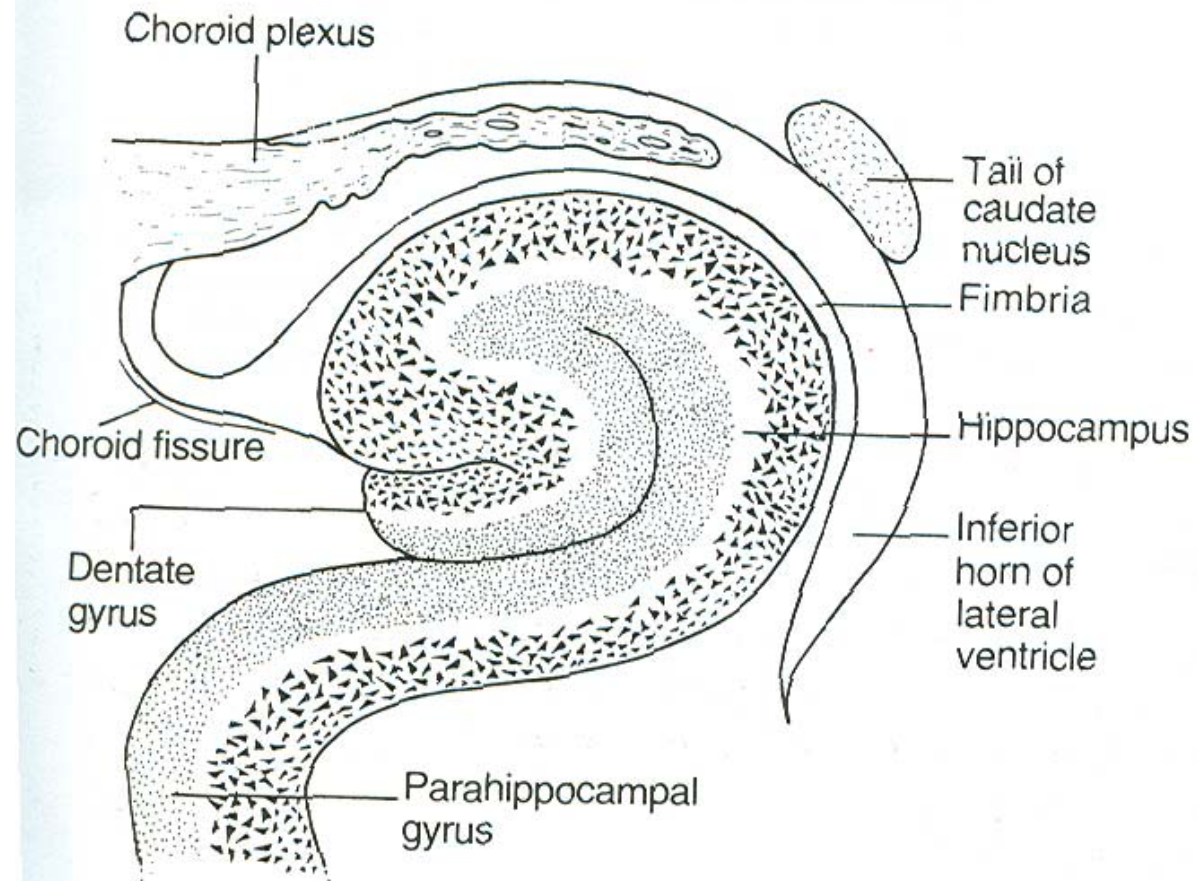
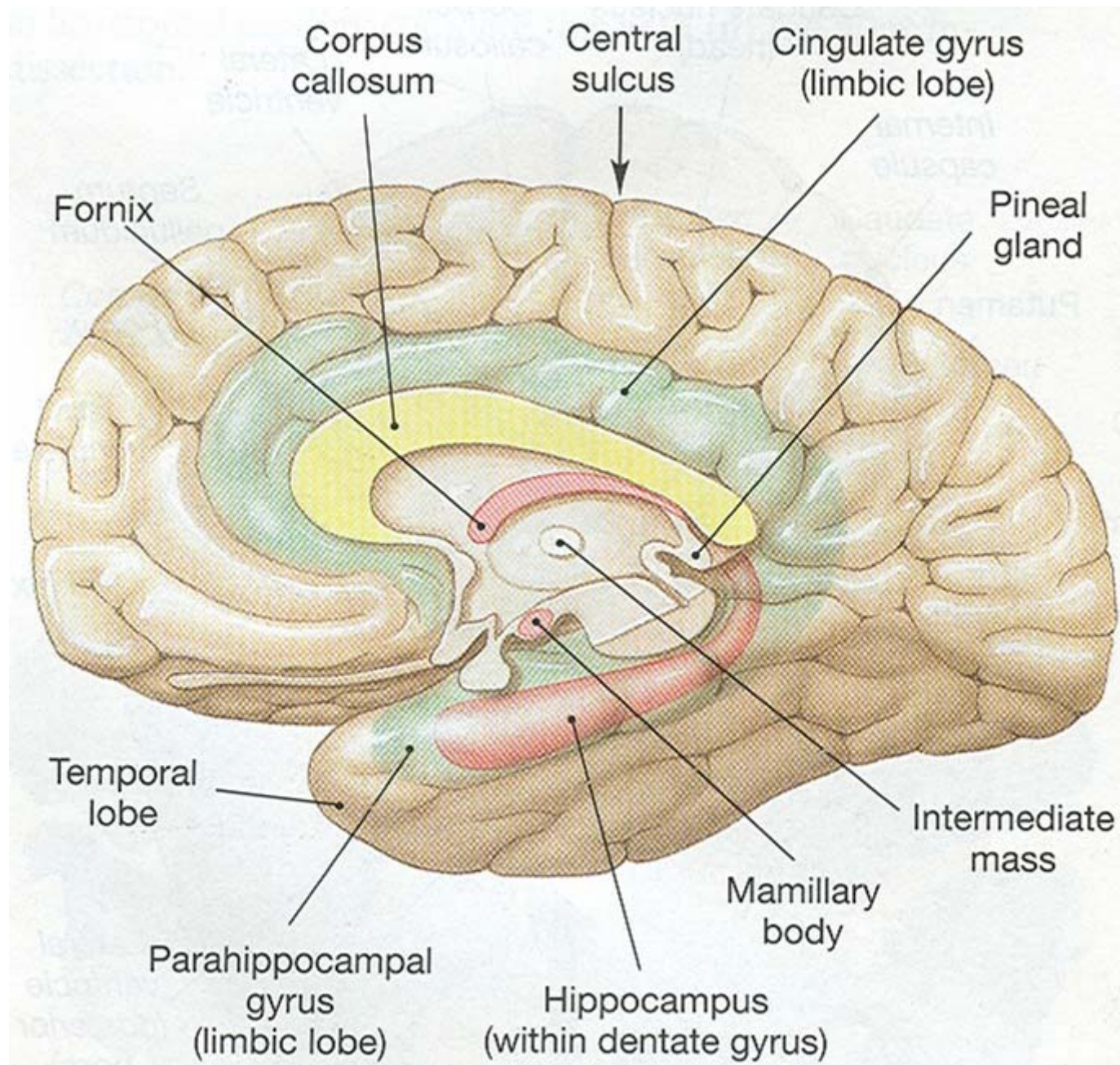
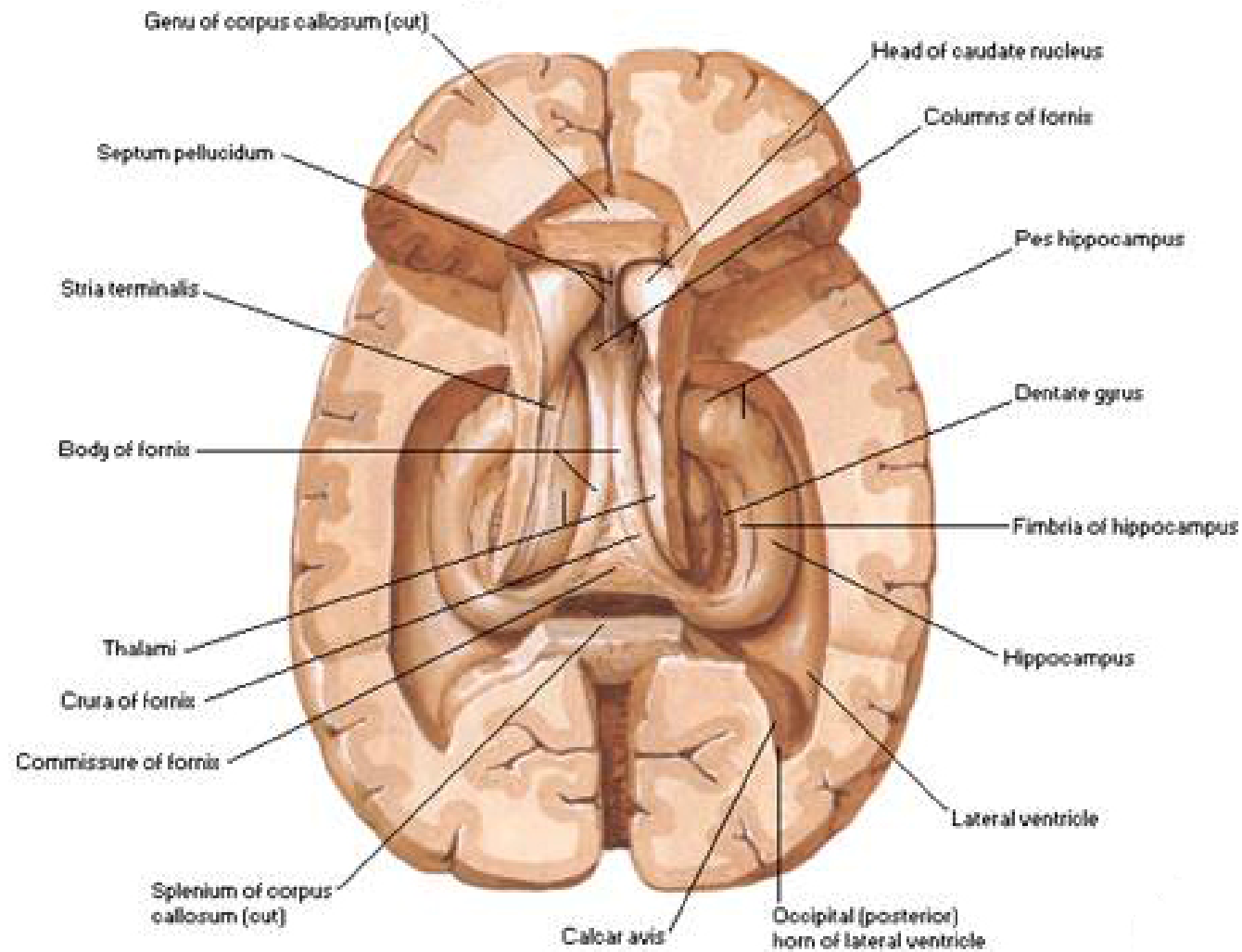


Fig. 16.7 Transverse section through the hippocampus and inferior horn of the lateral ventricle.



Hippocampus and Fornix Superior Dissection



Hippocampus and Fornix

Coronal Section - Posterior View

