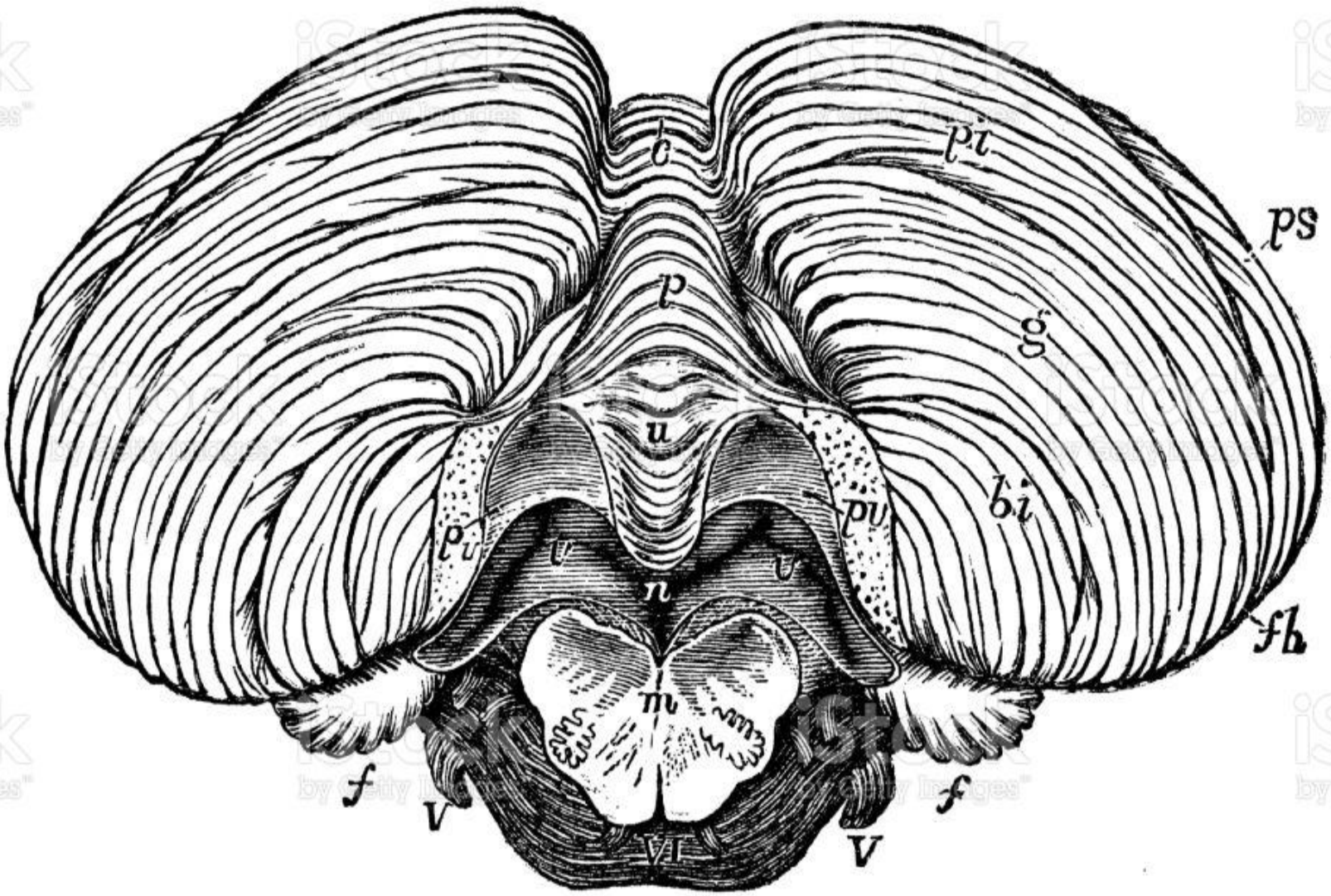
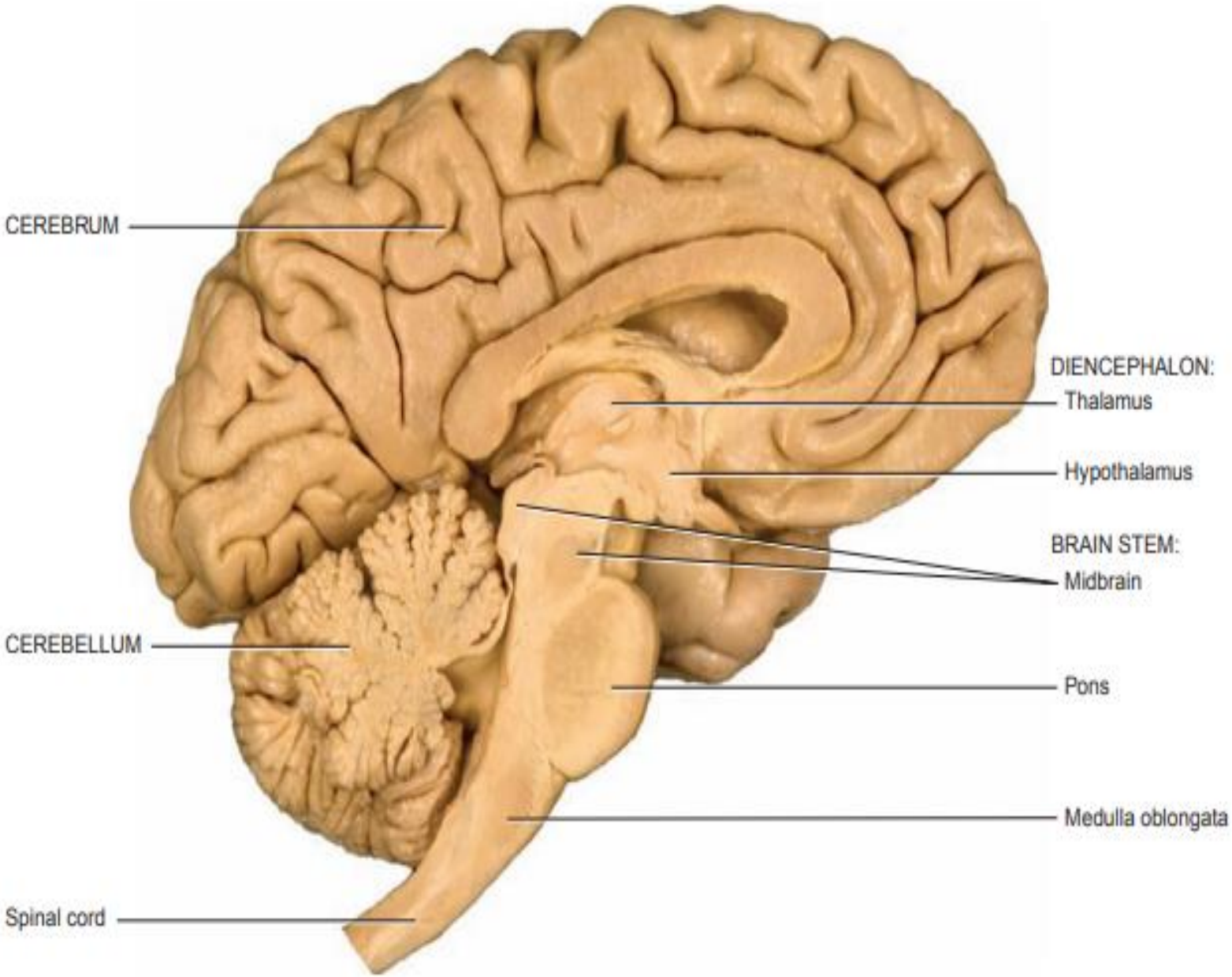
CEREBELLUM



- **Also c/d small brain**
- **Lies in posterior cranial fossa.**
- **Weight- 150 gms.**
- **The cerebellum is posterior to the medulla and pons and inferior to the posterior portion of the cerebrum.**
- **A deep groove known as the transverse fissure, along with the tentorium cerebelli, separate the cerebellum from the cerebrum.**

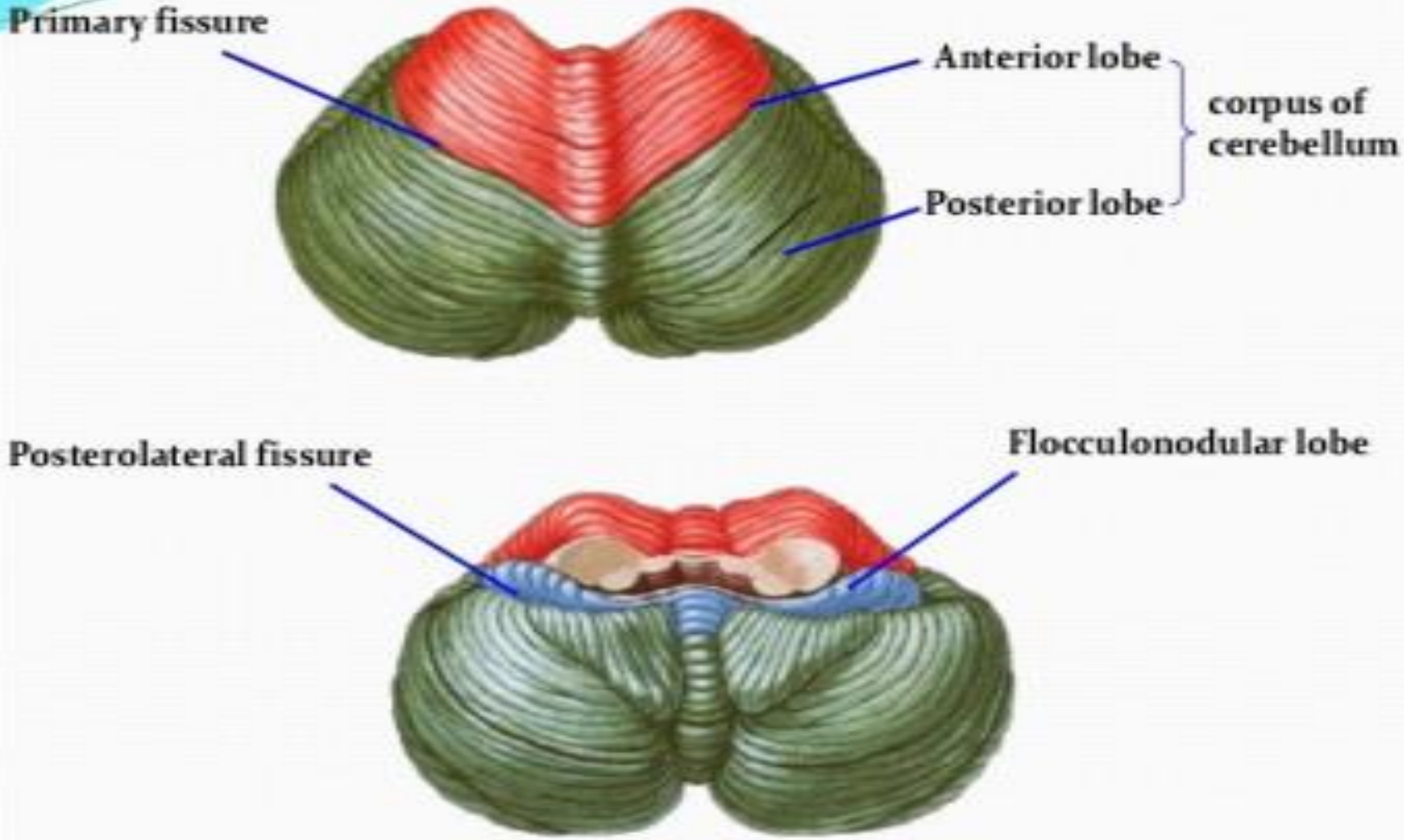


(b) Medial view of sagittal section

- **In superior or inferior views, the shape of the cerebellum resembles a butterfly.**
- **The central constricted area is the vermis (worm), and the lateral “wings” or lobes are the cerebellar hemispheres .**
- **Each hemisphere consists of lobes separated by deep fissures.**
- **Cerebellum – 2 surfaces (superior, inferior)**
- **On the superior aspect, there is no line of distinction b/w vermis and hemisphere.**

- **On the inferior aspect, the two hemisphere are separated by a deep depression c/d vallecula.**
- **The vermis lies in the depth of this depression.**
- **Paramedian sulcus- b/w vermis and hemisphere.**
- **Fissure-2**
- **Lobes-3**

Anatomical Subdivisions



Anterior lobe

Primary fissure

Pons

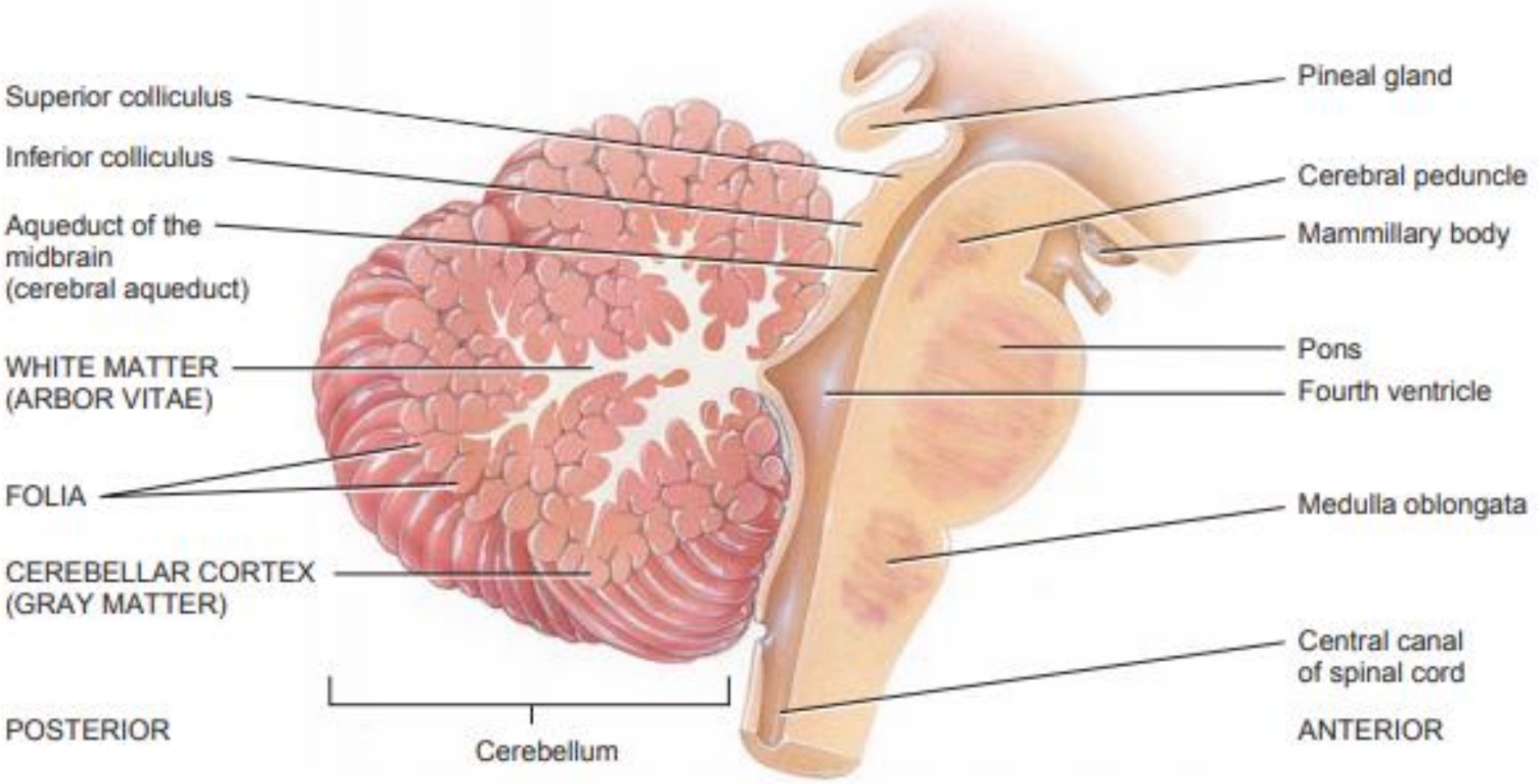
Flocculonodular lobe

Posterior lobe

Posterolateral fissure

Medulla

- **The superficial layer of the cerebellum, called the cerebellar cortex, consists of gray matter in a series of slender, parallel folds called folia (leaves).**
- **Deep to the gray matter are tracts of white matter called arbor vitae (tree of life) that resemble branches of a tree.**
- **Even deeper, within the white matter, are the cerebellar nuclei, regions of gray matter that give rise to axons carrying impulses from the cerebellum to other brain centers.**



(c) Midsagittal section of cerebellum and brain stem

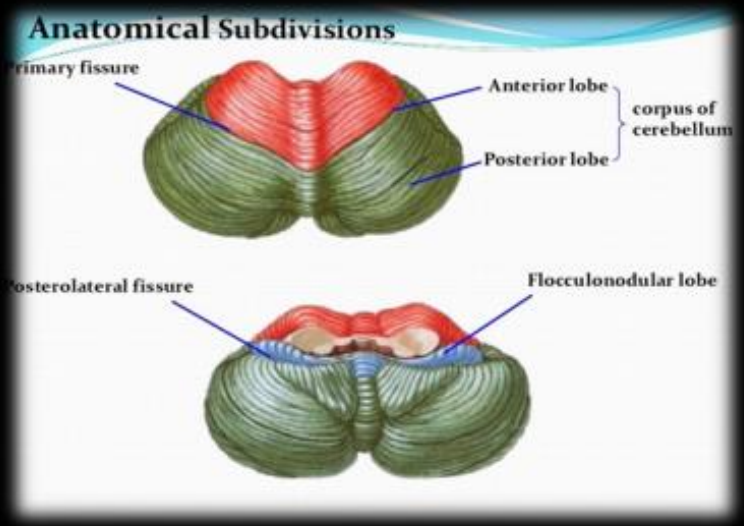
FIGURE 14.8 CONTINUES

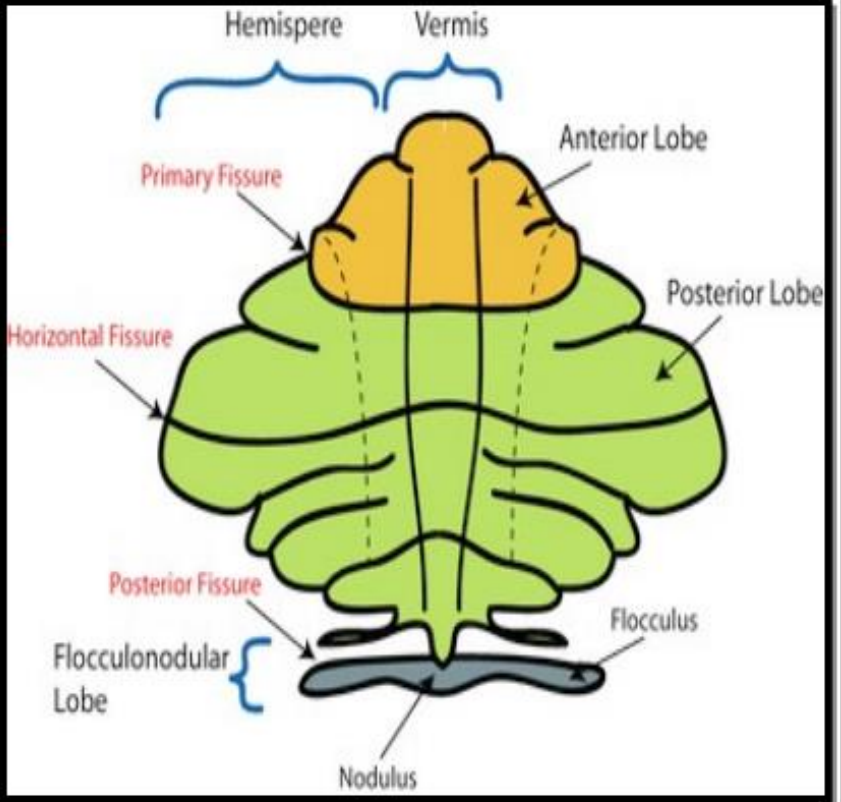
- **Three paired cerebellar peduncles attach the cerebellum to the brain stem. These bundles of white matter consist of axons that conduct impulses between the cerebellum and other parts of the brain.**
- **The superior cerebellar peduncles contain axons that extend from the cerebellum to the red nuclei of the midbrain and to several nuclei of the thalamus.**

- **The middle cerebellar peduncles are the largest peduncles; their axons carry commands for voluntary movements from the pontine nuclei into the cerebellum.**
- **The inferior cerebellar peduncles consist of axons of the spinocerebellar tracts that carry sensory information into the cerebellum from proprioceptors in the trunk and limbs**

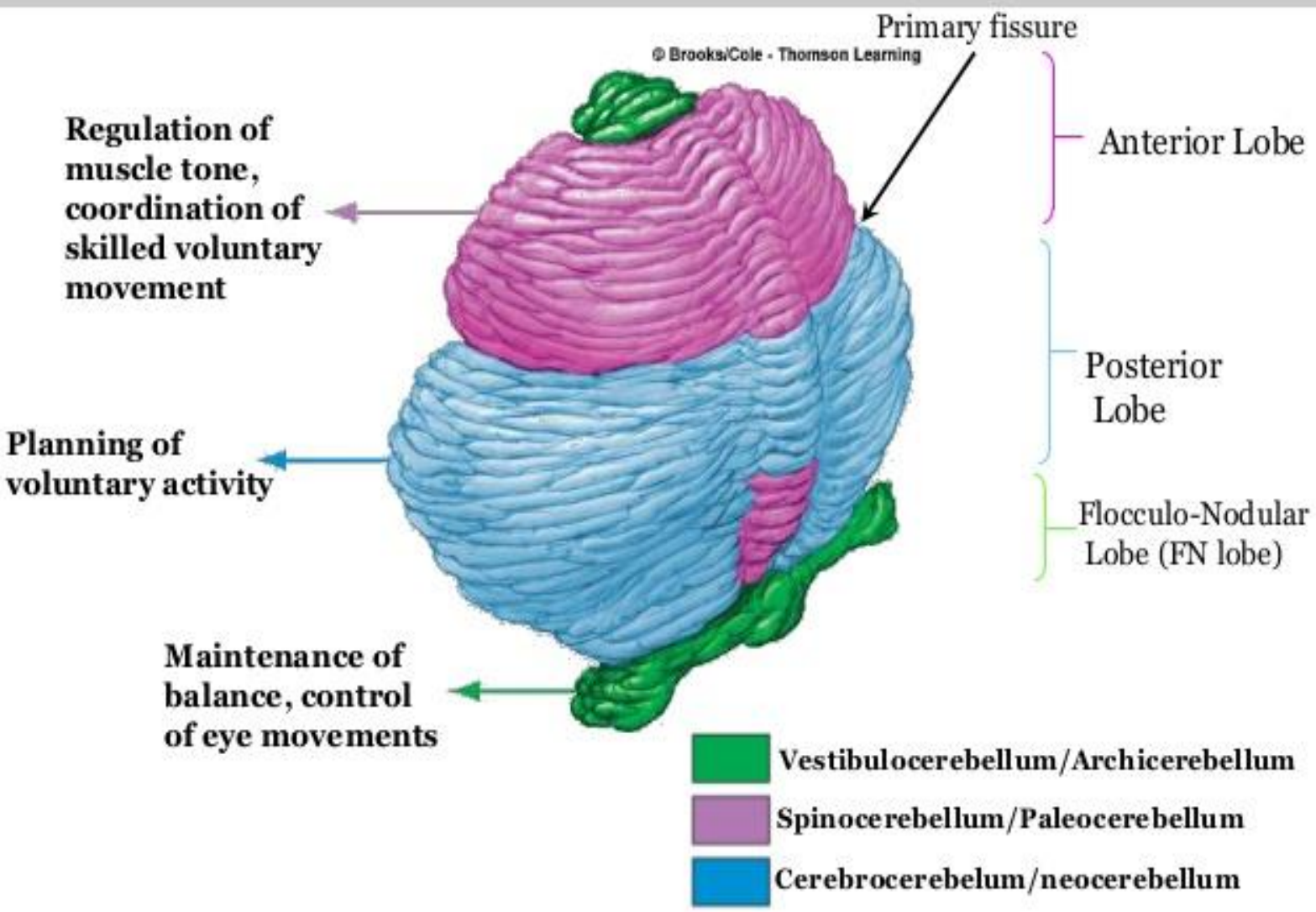
Anatomical divisions

- Anterior lobe.
- Posterior lobe.
- Flocculonodular lobe..





Functional and phylogenetic subdivision



Anatomical parts

- Parts of vermis.
  - Lingula
  - Central lobule
  - Culmen
  - Declive
  - Folium
  - Tuber
  - Pyramis
  - Uvula
  - Nodule.
- Parts of hemisphere.
  - No lateral projection.
  - Alae
  - Anterior quadrangular lobule
  - Posterior quadrangular lobule
  - Superior semilunar lobule
  - Inferior semilunar lobule.
  - Biventral lobule
  - Tonsil
  - Flocculus.

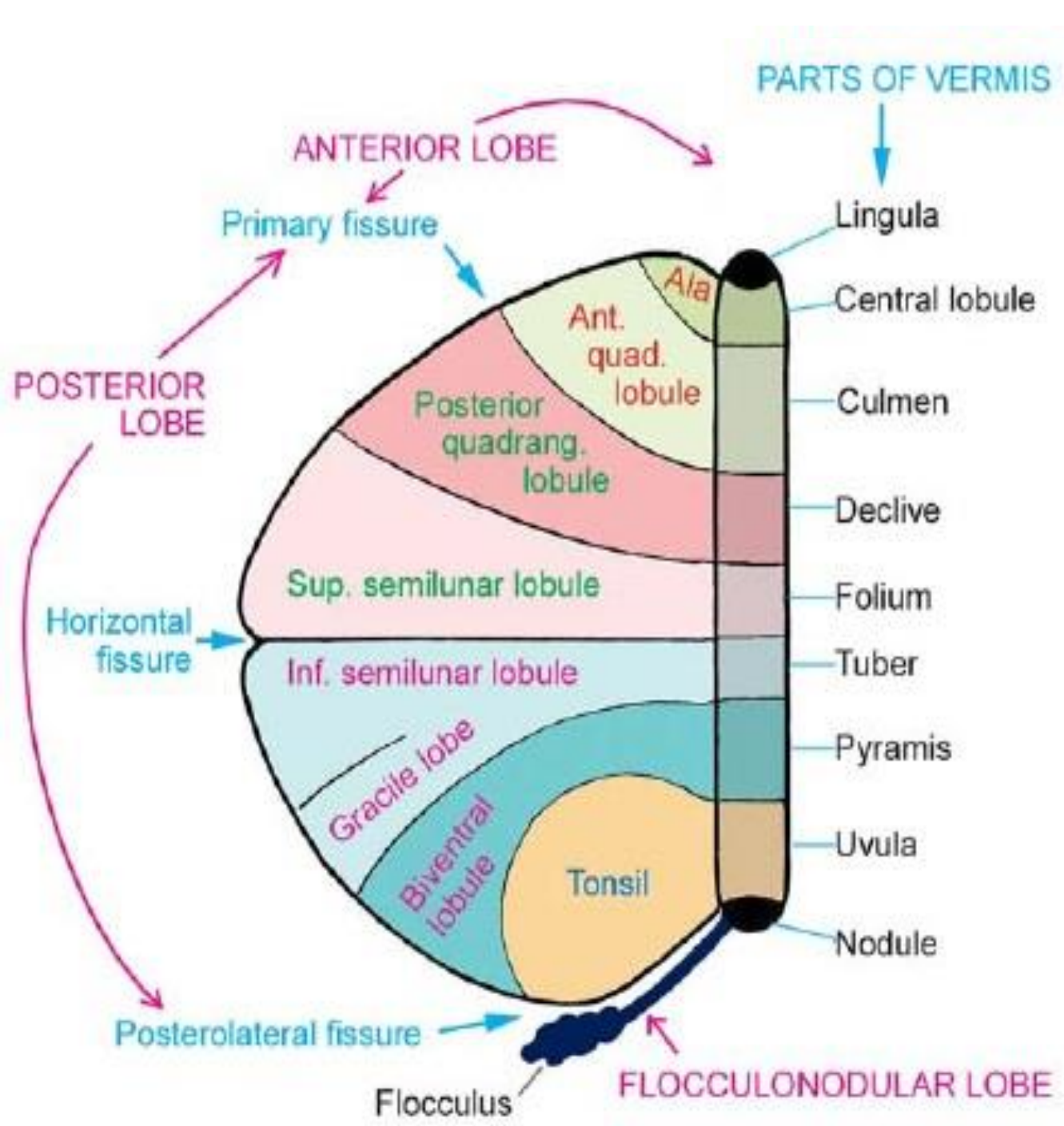
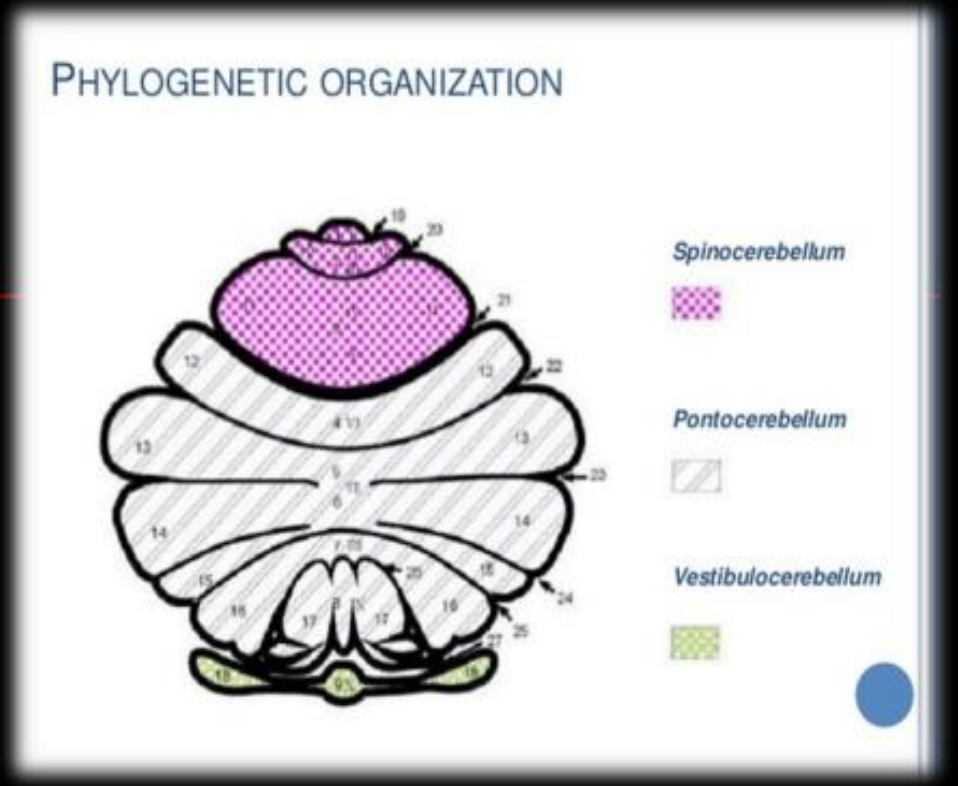


Fig. 7.1. Scheme to show the subdivisions of the cerebellum. From Fig. 7.3 note that the vermis is curved on itself so that the lingula and nodule are in fact close to each other.

Phylogenetically divisions



- Archicerebellum
  - Floculonodular lobe
  - Lingula
- Paleocerebellum
  - Anterior lobe except – lingula
  - Posterior lobe – pyramis, uvula & paraflocculus.
- Neocerebellum.
  - Whole posterior lobe except –pyramis & uvula.

Functional divisions.

- Vestibulocerebellum.
  - Consists of Floculonodular lobe
  - Vestibular connections
  - N. fastigeal – effector N.
  - Control body posture & equilibrium.
- Spinocerebellum.
  - Consists of Paleocerebellum.
  - N Interpositus. – effector N.
  - Postural reflexes.
- Corticocerebellum.
  - Central cerebellum
  - Dentate N.- effector nucleus.
  - Smooth performance.

Histological structure.

- Cerebellar cortex.
  - Molecular layer.
  - Purkinje cell layer.
  - Granule cell layer.
- White matter.
  - Projection fibres.
  - Association fibres.
  - Commissural fibres.
- Deep cerebellar nuclei.
  - Dentate nucleus.
  - Emboliform nucleus.
  - Globossus nucleus.
  - Fastigeal nucleus.

Sensory inputs.

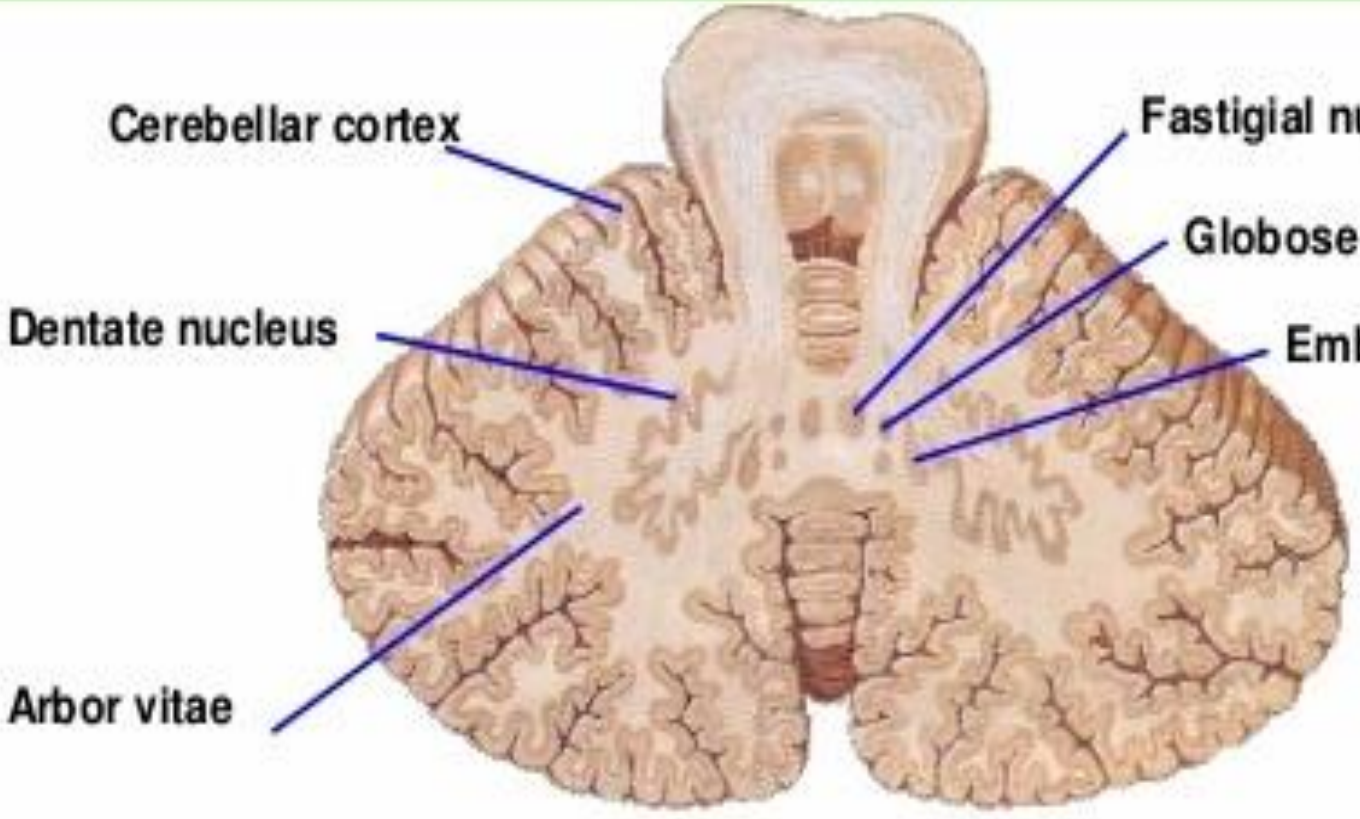
- **Climbing fibres**
  - Inferior olivary nucleus
  - Olivocerebellar tract.
  - Cerebellum.

  (purkinje cells)
- **Mossy fibres.**
  - Spino, vestibulo, reticulo, cuneo & corticoponto

Deep cerebellar nuclei

- Dentate nucleus.
- Emboliform nucleus.
- Globossus nucleus.
- Fastigeal nucleus.

Internal structures



Globose Nucl
Emboliform Nu
interposed Nu