DISSECTION OF THE SHEEP BRAIN

Mammalian brains have many features in common, and since human brains may not be available, sheep brains are often dissected as an aid to understanding mammalian brain structure. However, the adaptations of sheep differ from the adaptations of humans, so that comparisons of their structural features may not be precise.

PURPOSE OF THE EXERCISE

To observe the major features of the sheep brain and to compare them with the major features of the human brain.

LEARNING OBJECTIVES

After completing this exercise, you should be able to:

1. Identify the major features of the sheep brain.
2. Locate the larger cranial nerves of the sheep brain.
3. List several differences and similarities between the sheep brain and the human brain.

Materials Needed

dissectible model of human brain
preserved sheep brain
dissecting tray
dissection instruments
long knife

PROCEDURE

1. Obtain a preserved sheep brain and rinse it thoroughly in water to remove as much of the preserving fluid as possible.
2. Examine the surface of the brain for the presence of the meninges. (The outermost layer of these membranes may have been lost during the removal of the brain from the cranial cavity.) If the meninges are present, locate the following:

   dura mater—the thick, opaque outer layer

   arachnoid mater—the delicate, transparent middle layer, which is attached to the undersurface of the dura mater

   pia mater—the thin, vascular layer that adheres to the surface of the brain

3. Remove any remaining dura mater by pulling it gently from the surface of the brain.
4. Position the brain with its ventral surface down in the dissecting tray. Study figure 26.1 and locate the following features on the specimen:

   cerebral hemispheres

   convolutions (gyri)

   sulci – grooves

   longitudinal fissure

   frontal lobe

   parietal lobe

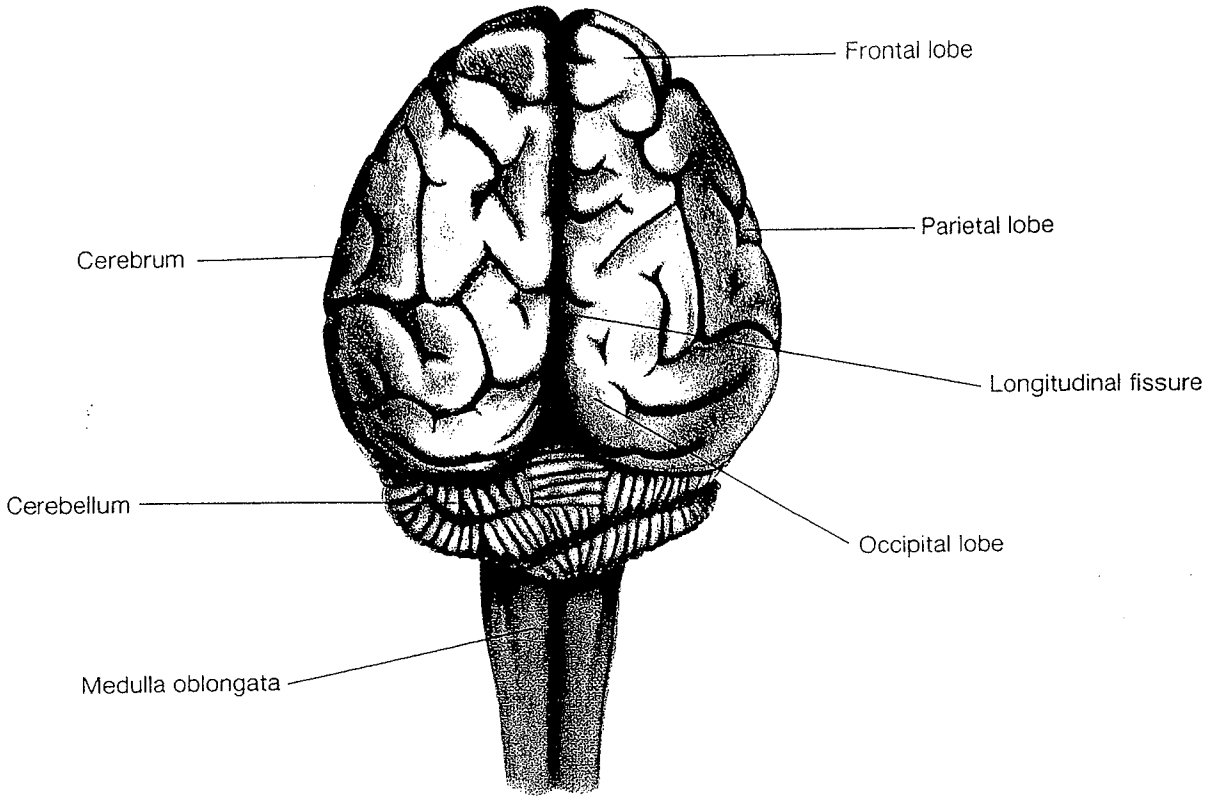
   temporal lobe

   occipital lobe

   cerebellum

   medulla oblongata

Figure 26.1 The dorsal surface of the sheep brain.



5. Gently separate the cerebral hemispheres along the longitudinal fissure and expose the transverse band of white fibers within the fissure that connects the hemispheres. This band is the corpus callosum.
6. Bend the cerebellum and medulla oblongata slightly downward and away from the cerebrum (fig. 26.2). This will expose the pineal gland in the upper midline.
7. Position the brain with its ventral surface upward. Study figure 26.3 and locate the following features on the specimen:

   longitudinal fissure

   olfactory bulbs

   optic nerves

   optic chiasma

   optic tract

   infundibulum (to which pituitary gland is attached)

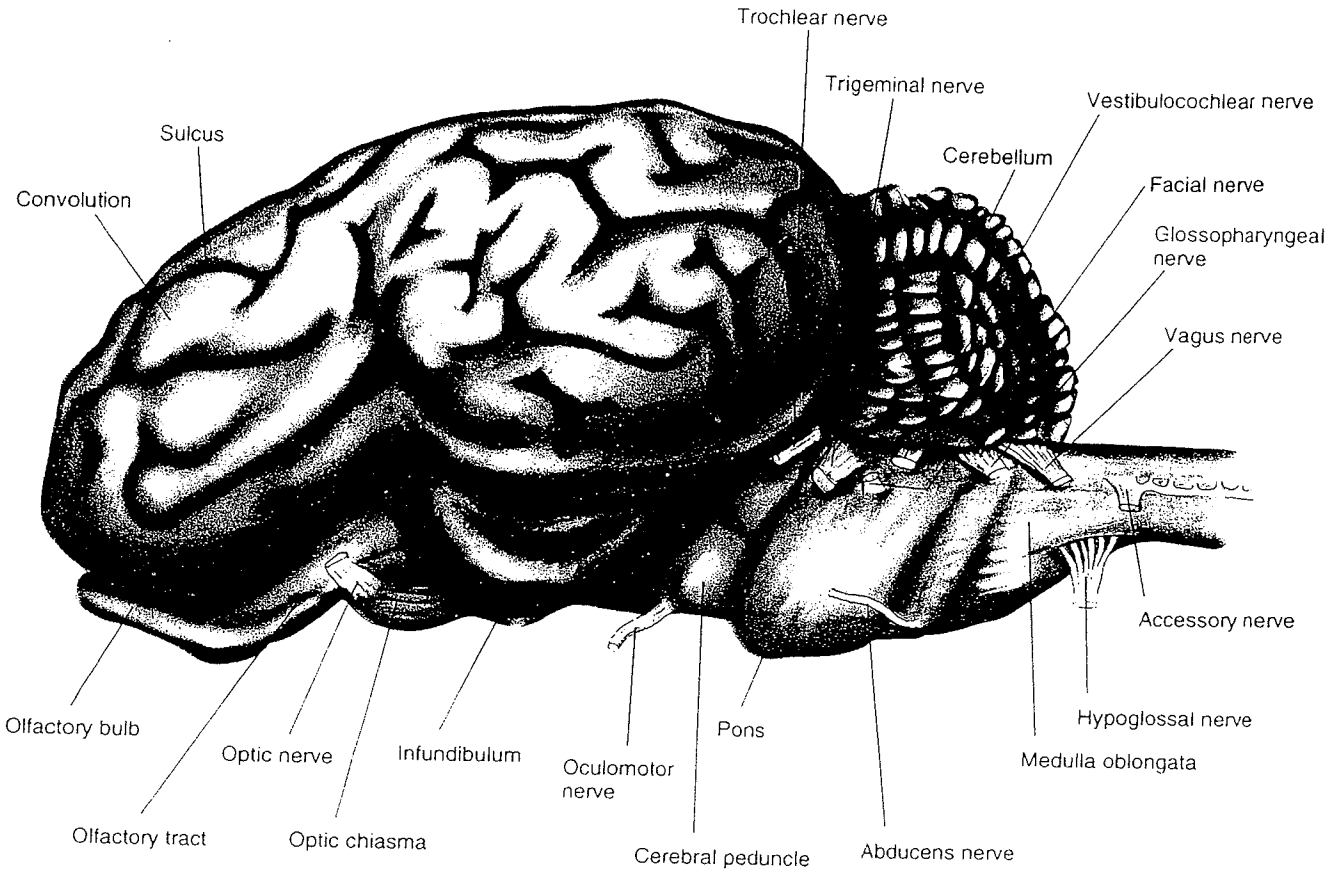
   pituitary gland (may be missing)

   midbrain

   pons

Figure 26.2 Gently bend the cerebellum and medulla oblongata away from the cerebrum to expose the pineal gland.

Figure 26.3 Lateral surface of the sheep brain.



8. Although some of the cranial nerves may be missing or are quite small and difficult to find, locate as many of the following as possible, using figures 26.3 and 26.4 as references:

   oculomotor nerves

   trochlear nerves

   trigeminal nerves

   abducens nerves

   facial nerves

   vestibulocochlear nerves

   glossopharyngeal nerves

   vagus nerves

   accessory nerves

   hypoglossal nerves

9. Using a long, sharp knife, cut the sheep brain along the midline to produce a median (midsagittal) section. Study figure 26.5 and locate the following features on the specimen:

   cerebrum

      cerebral cortex

      white matter

      gray matter

   olfactory bulb

   corpus callosum

   brain stem

   diencephalon

      optic chiasma

      infundibulum

      pituitary gland

      thalamus

      hypothalamus

      pineal gland

   midbrain

   pons

   medulla oblongata

10. Dispose of the sheep brain as directed by the laboratory instructor.
11. Complete parts A and B of laboratory report 26 on page 175.

Figure 26.4 Ventral surface of the sheep brain.

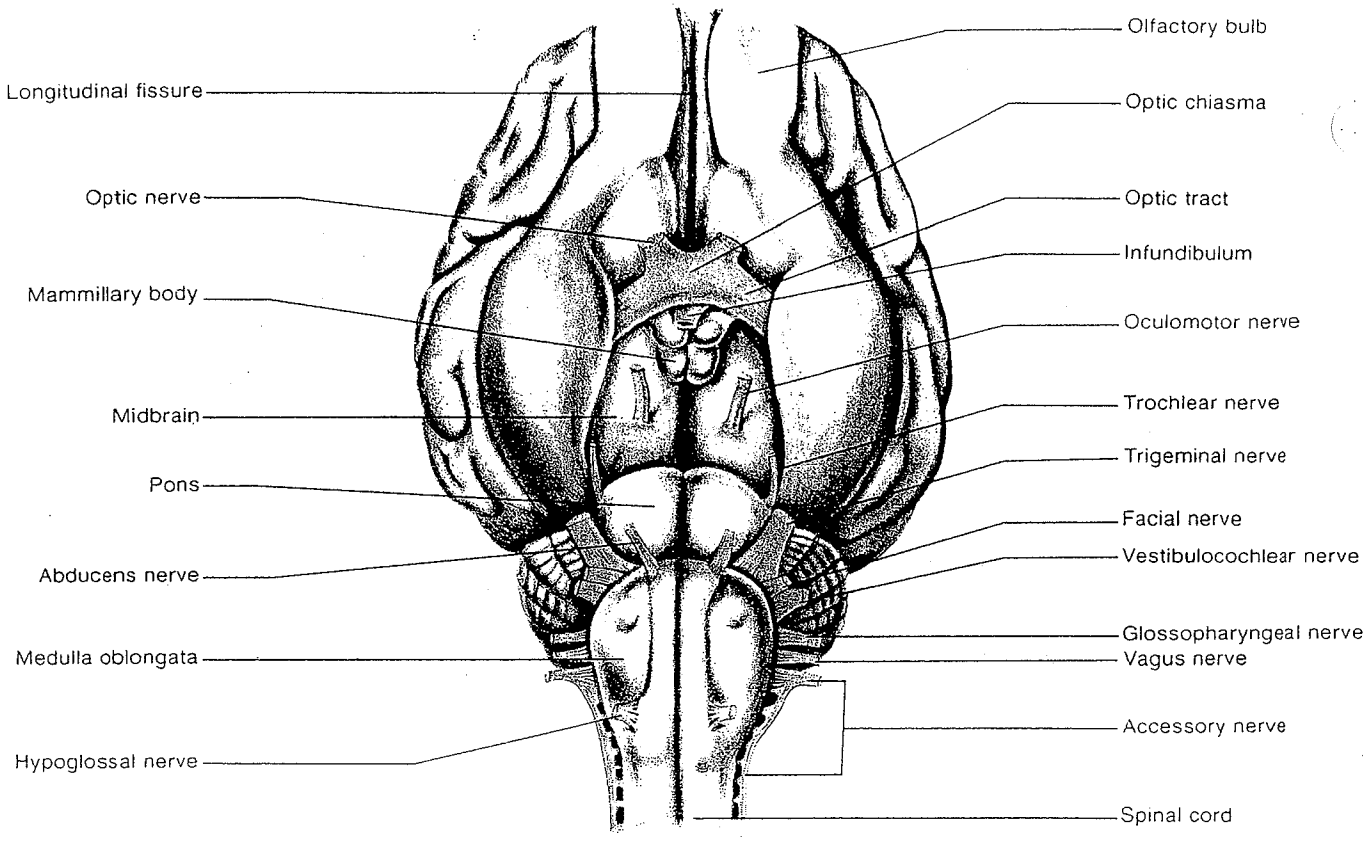


Figure 26.5 A midsagittal section of the sheep brain.