

INTEGRATIVE BIOLOGY 245
EXAMINATION III, MAY 8, 2007

Please mark "A" for true; Mark "B" for false

Part I. Upper medulla

*** Nucleus solitarius

- B1. This structure is primarily motor in function.
- A2. Cranial nerve IX contributes to this nucleus.
- A3. Sensation from the abdominal viscera enters this nucleus.
- A4. Taste buds on the anterior 2/3 of the tongue are innervated by this nucleus.

***Nucleus ambiguus

- A5. Sends fibers to laryngeal muscles.
- B6. Receives sensations from the semilunar ganglion.
- B7. Carries out functions similar to dorsal motor X.
- A8. Is found in the lateral reticular formation of the medulla.

***Inferior olivary nucleus

- B9. Projects only to the pontine nuclei
- B10. Projects as mossy fibers to cerebellar granule cells
- A11. Through climbing fibers is a powerful excitatory source to Purkinje dendrites.
- B12. Sends fibers to cerebellum through the middle cerebellar peduncle.

***Restiform body (inferior cerebellar peduncle)

- B13. Conveys conscious proprioception input to the cerebellum.
- A14. Conveys unconscious proprioception input to anterior lobe of cerebellum.
- A15. Conveys vestibular fibers to floccular nodular lobe.
- B16. Conveys fibers from dentate nucleus to red nucleus.

Level of Pons

***Superior cerebellar peduncle

- B17. Conveys conscious proprioception to cerebellum.
- A18. Fibers from the dentate nucleus can have influence over the ventral lateral nucleus of the thalamus.
- B19. Contains fibers which decussate in dorsal midbrain.
- B20. Primarily originates from Purkinje axons.

***Seventh cranial nerve nucleus

- B21. Innervates medial rectus extraocular eye muscles
- A22. Sends axons to skeletal muscles superior to eyebrows.
- A23. If lesioned, causes Bell's palsy.
- B24. Innervates root canals of the teeth.

***Temporal Lobe

- B51. Consists of three main gyri, the inferior of which has several transverse gyri, collectively called Heschl's gyrus.
- B52. Contains the uncus which lies directly over the entorhinal cortex.
- A53. According to G. Ojeman, shows that the middle temporal gyrus is the source of Wernicke's area in "intelligent people."
- A54. Lesions in inferior temporal lobe cause interference with retention of visual memories.

***Association cerebral cortical fibers

- A55. Include the cingulum which connects frontal cortex to the entorhinal cortex in addition to other cortical areas.
- A56. Connect one gyrus to the adjacent one.
- B57. Cross the midline to the opposite hemisphere.
- A58. Include the uncinate bundle which connects the orbital gyrus and inferior frontal gyrus with the anterior temporal lobe.
- A59. Include the arcuate bundle which connects the middle and superior frontal gyri with the anterior temporal lobe.

***Commissural fibers

- B60. Include the anterior commissure which connect the right amygdala with the left.
- A61. The posterior commissure provides for the consensual pupillary light reflex.
- A62. The habenular commissure connects olfactory inputs.
- A63. The massa intermedia is larger in the human female than in the male.

***Internal capsule

- B64. Fibers from the dorsomedial nucleus of the thalamus go through the genu in route to the prefrontal cortex.
- B65. Fibers from the corticobulbar pathway descend through the anterior limb.
- A66. Retrolenticular fibers include the optic radiation.
- A67. A lesion in the internal capsule has more widespread disability than in any other region of the nervous system.

***Cerebral cortical cells

- A68. Most cells in the cerebral cortex are pyramidal and stellate cells.
- A69. Golgi I cells have long axons which leave the cortex.
- A70. Golgi II cells have short axons which do not leave the cortex.
- B71. Stellate cells are Golgi type one cells.

***Olfactory system

- B72. Axons from mitral and tufted cells form the olfactory nerve
- B73. Axons from granule cells in the olfactory bulb form the anterior commissure.
- A74. The periamygdaloid and prepyriform cortex constitute the olfactory cortex.
- A75. The amygdala directly receives olfactory input from the lateral olfactory stria.

*** A 35 year-old machinist came to the physician to complain that he was having trouble on the job. He said every time he began working at the machine he would see double and his left arm and leg would shake. The physician examined him and noted the following:

1. There was anesthesia on the left side of the body and analgesia and thermal anesthesia on the left side of the face.
2. There was ptosis and external (lateral) strabismus of the right eye.
3. The right pupil was dilated and did not respond to light
4. The left upper limb exhibited an intention tremor and dysmetria.

Which structures are involved?

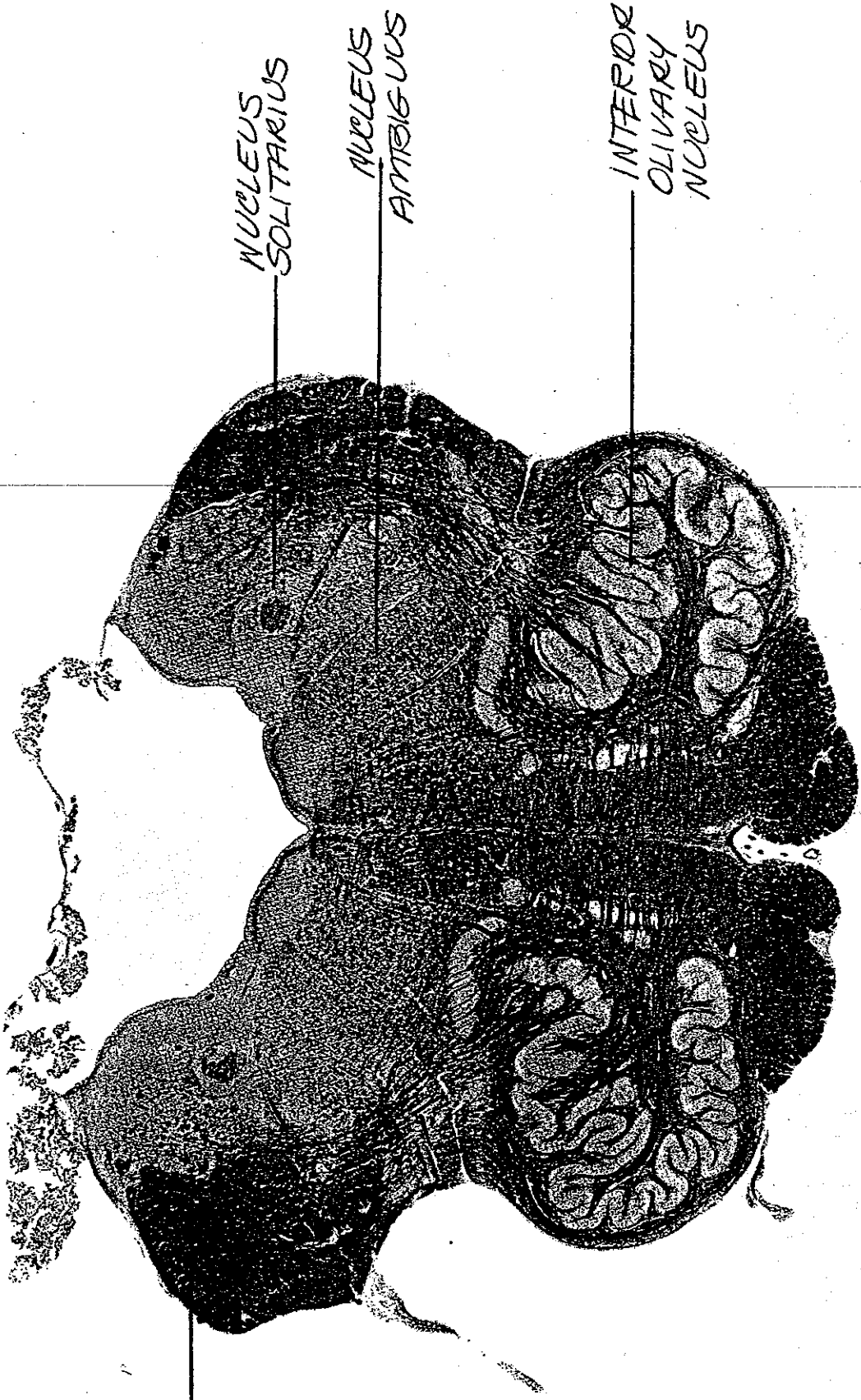
- A 95. Oculomotor nerve
- A 96. Spinal thalamic tract
- A 97. Superior cerebellar peduncle (cerebellothalamic fibers)
- A 98. Red nucleus
- A 99. Spinotrigeminal tract
- B 100. Caudate nucleus

EVERY PERSONAL CONNECTION HAS MEANING.

&

LAUGHTER IS LIFE'S SWEETEST CREATION.

Where in the brain? Evaluation of input from the prefrontal cortex and expression from the brain stem.



NUCLEUS SOLITARIUS

NUCLEUS AMBIGUUS

INTERIOR OLIVARY NUCLEUS

RESTIFORM BODY

UPPER MEDULLA LEVEL

OCULOMOTOR
NUCLEUS

SUBSTANTIA
NIGRA

