

Part A – Multiple Choice (20 points) – circle the letter of the correct answer

1. The hormone epinephrine is secreted from the

- a. anterior pituitary.
- b. adrenal cortex.
- c. thyroid.
- d. adrenal medulla.

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2. Peptide hormones typically affect a cell by

- a. entering the cell and providing a source of metabolic energy.
- b. interacting with specific receptors located in the cell nucleus.
- c. binding to DNA and altering gene expression.
- d. binding to receptors on the cell membrane and causing the release of second messengers.

3. Some flowers attract bees by releasing _____ into the air.

- a. nectar
- b. pheromones
- c. pollen
- d. allomones

4. Neuronal and hormonal communication both involve

- a. all-or-none impulses.
- b. specialized receptor molecules.
- c. movement of materials through the bloodstream.
- d. voluntary control.

5. _____ hormones directly affect the secretion of endocrine glands.

- a. Posterior pituitary
- b. Endocrine
- c. Releasing
- d. Tropic

6. Which of the following is true about secondary sex characteristics?

- a. Mean age at puberty is increasing.
- b. Testosterone promotes development of male secondary sex characteristics such as muscular development, facial hair, and voice deepening.
- c. In both males and females, estradiol promotes skeletal growth.
- d. Changes in the quantity and distribution of fat is promoted by testosterone.

7. Müllerian ducts develop to form

- a. internal male reproductive structures.
- b. labia.
- c. internal female reproductive structures.
- d. ovaries.

8. Sperm and ova are known as _____, and when they fuse they form a(n) _____.

- a. undifferentiated cells; zygote
- b. zygotes; embryo
- c. zygotes; gamete
- d. gametes; zygote

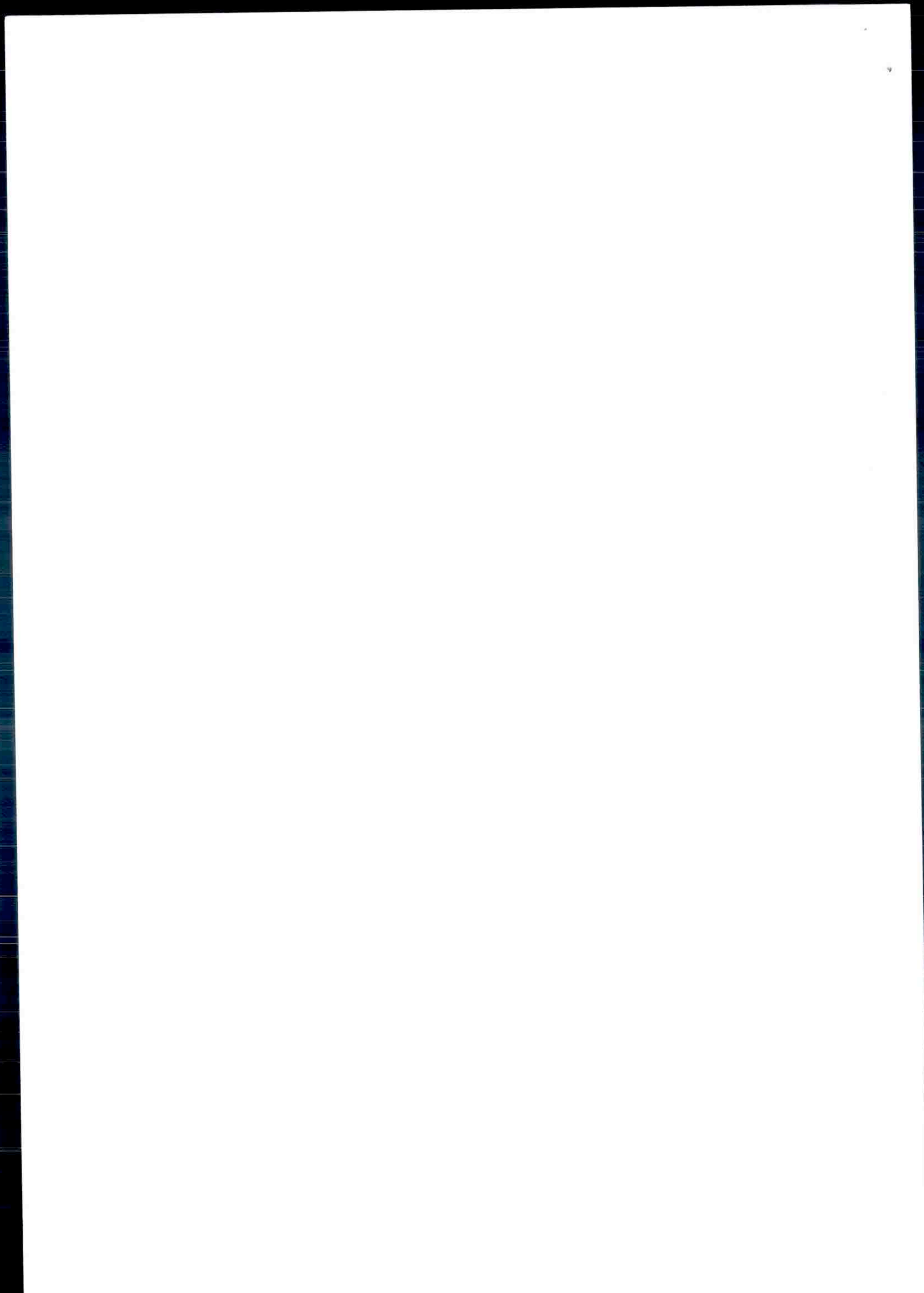


9. Injecting leptin directly into the brain is most effective in changing feeding behavior and body weight if the target of the injection is the
- hypothalamus.
 - cortex.
 - choroid plexus.
 - pituitary.
10. Amino acids that are not manufactured by our bodies are called:
- obligatory.
 - inorganic.
 - essential.
 - dietary.
11. Stages 3 and 4 SWS are especially prominent during _____ of a night's sleep.
- sleep periods during the last half
 - sleep periods during the first half
 - only the last complete cycle
 - the middle third
12. Electrical stimulation of the reticular formation leads to immediate
- SWS.
 - REM sleep.
 - awakening.
 - PGO waves.
13. Sleep that immediately follows a period of learning has the apparent effect of
- blocking long-term retention.
 - improving long-term retention.
 - undoing the learning.
 - impairing retrieval of the learned material.
14. The striped appearance of muscle fibers is due to the regular arrangement of thick _____ filaments and thin _____ filaments.
- extrafusal; intrafusal
 - myosin; actin
 - intrafusal; extrafusal
 - afferent; efferent
15. Stretch of a muscle first activates
- spinal motoneurons.
 - muscle spindles.
 - gamma efferents.
 - slow motor fibers.
16. For a joint to straighten,
- Both the flexor and extensor contract.
 - Both the flexor and extensor relax.
 - Flexor contracts and extensor relaxes.
 - Extensor contracts and flexor relaxes.

17. Patients with alcoholism often have damage to the _____, which results in impaired gait.
- basal ganglia
 - cerebellum
 - Spinal ventral horns
 - primary motor cortex
18. Compared to premotor cortex, M1 is thought to be more involved in
- imagining movement
 - timing and coordination of movement
 - the generation of movement commands and initiating movements
 - planning spatial and temporal features of movement
19. The fundamental initial pathological change in Parkinson's disease is
- death of neurons of the substantia nigra.
 - destruction of the caudate and putamen.
 - decreased availability of serotonin.
 - atrophy of motor cortex.
20. Myasthenia gravis is thought to be caused by
- toxins that block neuromuscular junctions.
 - antibodies that attack acetylcholine receptors.
 - deficient development of neuromuscular junctions.
 - excessive synapse elimination.

Part II – Short Answer (1.5 points each X 20 = 30 points)

- _____ hormones are derived from 4 rings of carbon atoms.
- The corpus luteum releases estradiol and _____, which promotes pregnancy.
- Stimulation of the nipple of a breast-feeding mother stimulates the release of _____ from the _____ pituitary.
- The hormone promoting the development of the Wolffian system is _____.
- An XO genotype would have a *male / female* phenotype (circle the correct answer).
- Male rats do not engage in sexual behavior during the _____ period that follows ejaculation.



7. Water moves between the intracellular and extracellular compartments by _____.
8. The type of diabetes which develops late in life (that is, *not* during childhood), is called type _____.
9. While the Ventromedial Hypothalamus (VMH) is involved in the feeling of fullness, the _____ Hypothalamus is involved in the feeling of hunger. (Lateral).
10. An organism's ability to adjust its physiological processes to maintain equilibrium is called _____.
11. Physiological regulation of body temperature, via autonomic responses like shivering, is especially affected by lesions of the _____.
12. When the body temperature increases too much, some proteins in the body stop functioning. This condition is called _____.
13. A diurnal animal usually sleeps during the _____.
14. Melatonin pills have become popular as a sleep aid and seem to reduce the effects of _____.
15. During _____ sleep we have very vivid dreams sleep.
16. Name at least 2 biological functions of sleep _____
_____.
17. A single motor axon and all the muscle fibers it innervates are called a _____.

18. Which disease is related to the degeneration of the substantia nigra?

19. Which part of the neuron is most likely to be accidentally cut? _____

20. Damage to the spinal cord at the cervical level would cause _____

Part III – Essay Questions. Answer 5 of the following 9 questions (8 points each, total of 40 points). You may answer up to 1 additional question for 8 additional points of extra credit. At the beginning of your answer, write the number of the question you are answering. You may continue on the other side of the page if needed.

1. Explain, with examples, how differences in reproductive investment affect differences between male and female sexual strategies.

2. What are the problems posed by homosexuality to evolutionary theory, and how does evolutionary theory respond to them?

3. Explain the “good genes” theory of sexual selection, and provide examples of the behavior it explains.

4. Give at least 7 general principles of hormone action.

5. Describe the involvement of genes and hormones in proper development of male anatomy.

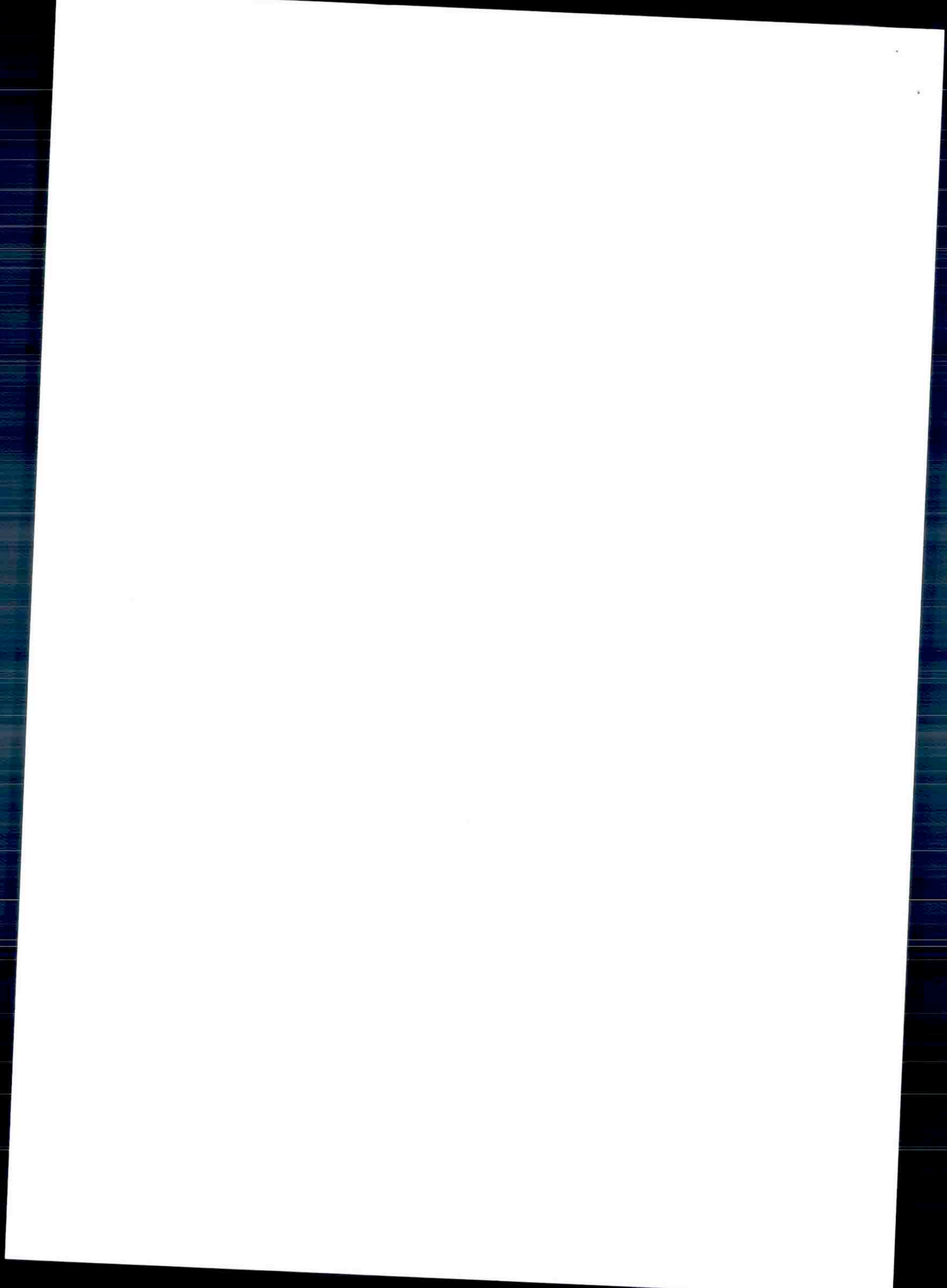
6. Compare and contrast ectothermic and endothermic regulation of body temperature, illustrating your answer with specific examples of each type.

7. Discuss the role of the basal ganglia in motor control, illustrating your answer with at least one human clinical example.

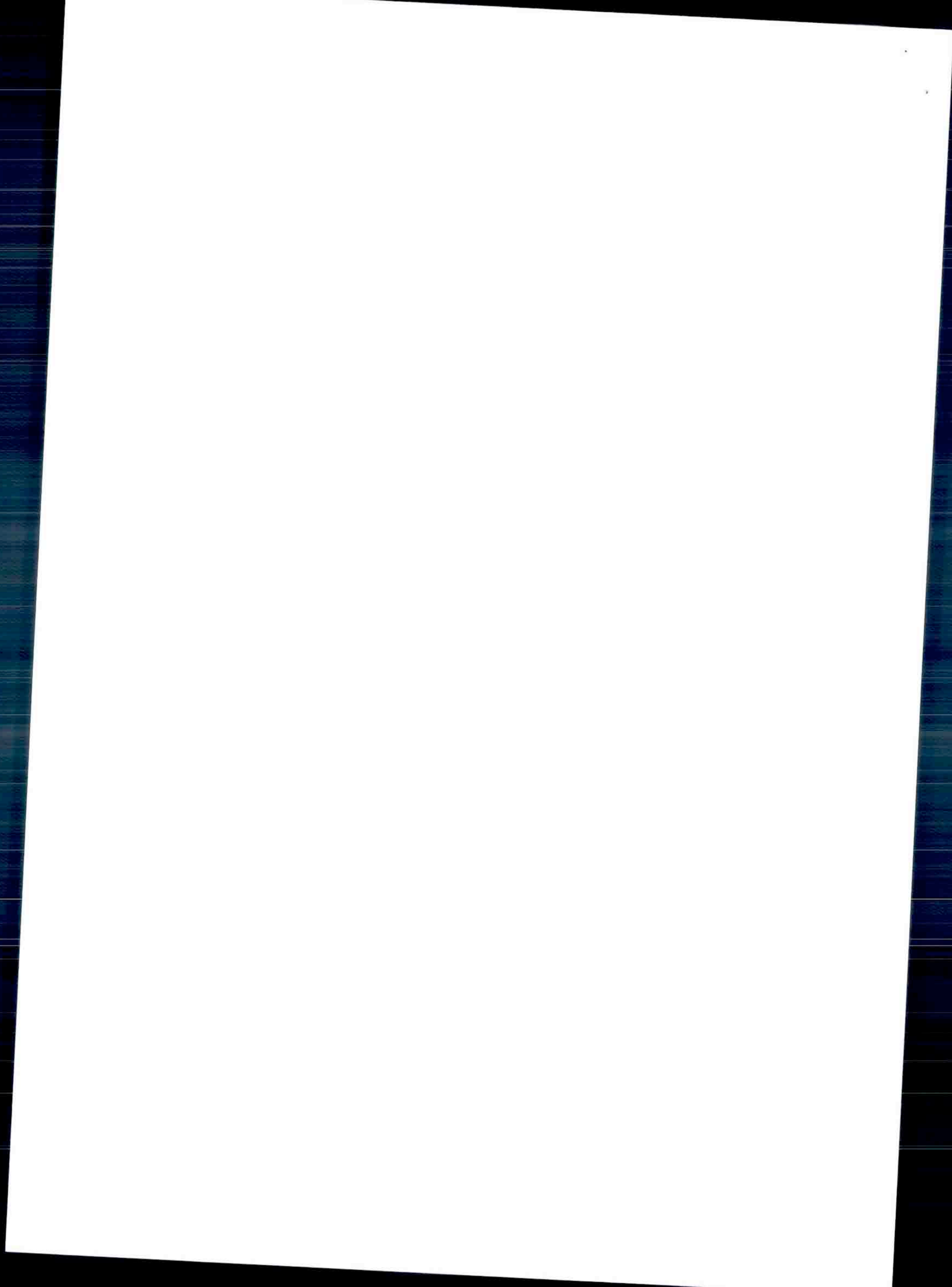
8. Describe three phases in the involvement of glucose in feeding behavior.

9. Describe some of the major sleep disorders, their apparent causes, and the currently available treatments.

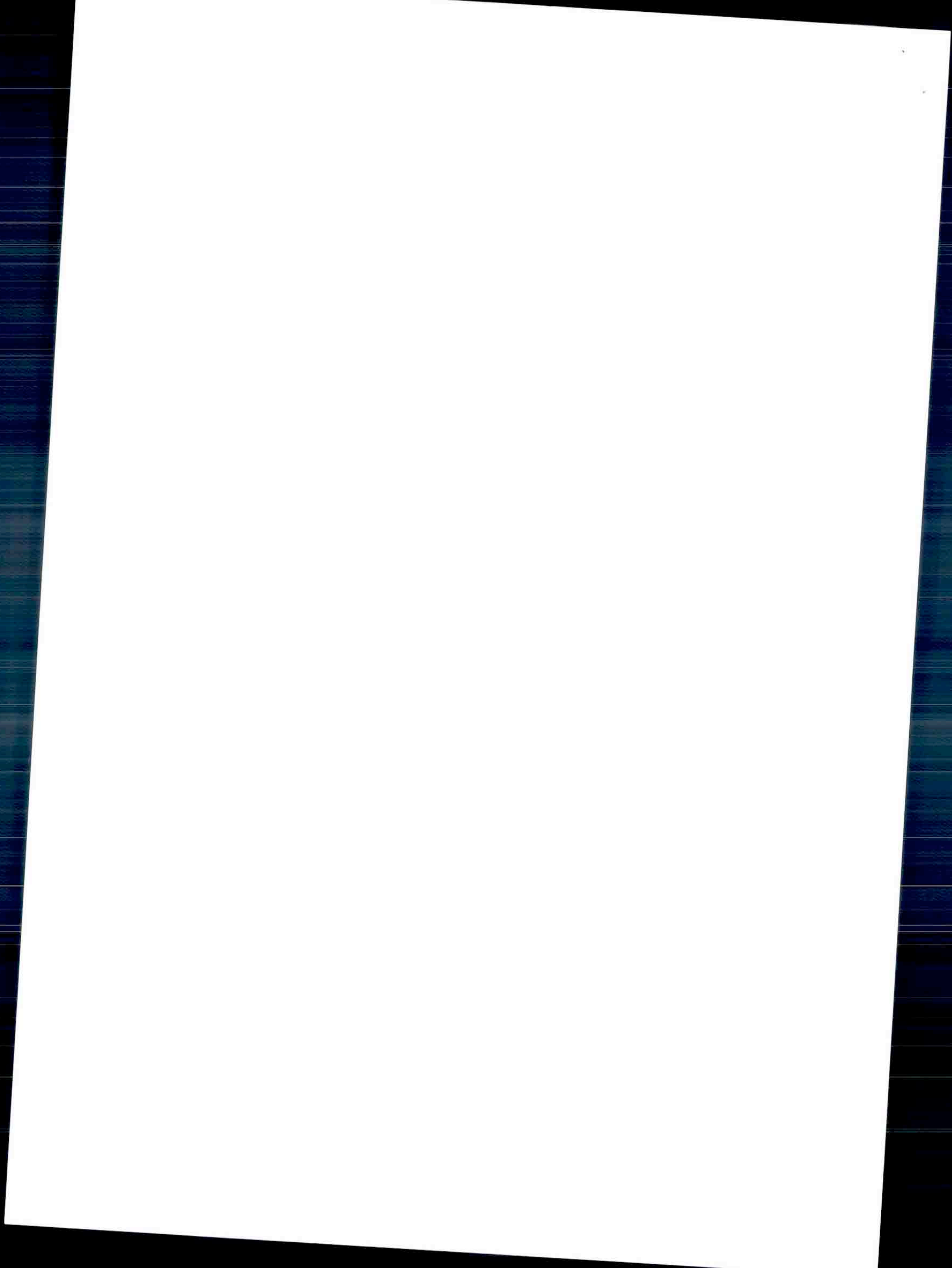
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Part IV - Picture labeling – 10 points

Label which part of the motor homunculus maps the arm, face, and leg (4 points).



Label the three major areas of motor cortex (6 points):

