

Questions based on Schneider chapters and lectures:

1. What cranial nerves are attached to the forebrain? (Some of these are not among the 12 usually named for human brain.)
2. What studies in recent years have provided evidence for the old hypothesis that the endbrain in early chordate evolution was dominated by olfaction?
3. Contrast the suggested early functional roles of the medial pallium and the corpus striatum.
4. Is it true that brain size always increases in evolution? Why would it ever decrease? (See also: Striedter readings.)
5. What happened, in evolution, to the original olfactory parts of the endbrain? (What terms are used? What were the major changes in the endbrain?)
6. What was the major cause of the differentiation of dorsal and ventral parts of the corpus striatum?
7. From what part of the primitive neural tube did the neocortex evolve? What kinds of data support this

Questions on readings: Striedter.

1. Can we link the evolution of neocortex and its expansion to the evolution of intelligent behavior? Why or why not?
2. What similarity in metabolism and autonomic control is shared by birds and mammals, and seems to be a precursor of enlarged brains?
3. Evidence indicates that early placental mammals lost some of the color vision present in ancestral pre-mammalian animals. Why? How did their vision probably change? (See discussion of Gordon Walls' "bottleneck hypothesis").
4. Besides the changes in the auditory system, what was the other likely change in sensory capacities of mammals, especially placental mammals?
5. Give a rough estimate of the relative size of telencephalic cortex in very early mammals. Were their brains small or large? How do we know this?
6. What are some major similarities and differences between reptilian (e.g., turtle) dorsal pallium and mammalian neocortex?
7. What major endbrain structure is found in reptiles and birds but not in mammals? What was the finding, surprising at the time, of Harvey Karten, working at MIT in the 1960s, about this structure?
8. Summarize the two major competing hypotheses concerning the mammalian homologue of this endbrain structure in sauropsids (reptiles and birds).
9. "The avian dorsal cortex is generally called the hyperstriatum, or 'Wulst'". What is this structure in terms of function and connections, and in what species is it most developed?

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9.14 Brain Structure and Its Origins

Spring 2009

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