I. Diencephalon
   A. Thalamus
      1. large cluster of nuclei
      2. two lateral masses joined in midline by intermediate mass
      3. switchboard for most sensory input
         a. synapse here
         b. sent to proper cortical region
      4. mood, unlocalized discomfort
   B. Epithalamus
      1. superior and posterior to thalamus
      2. pineal body (gland)
         a. endocrine
         b. melatonin
   C. Hypothalamus
      1. inferior part of diencephalon
         - walls and floor of third ventricle
         - from optic chiasm to mammillary bodies
      2. nuclei
         a. homeostasis
         b. hunger/ satiety
         c. thirst
            - control renal functions
         d. thermoregulation
         e. heart rate (via medulla oblongata)
         f. hormonal control
         g. sleep/wake cycles
         h. emotional responses
            - includes sexual behavior and response
      3. infundibulum
      4. pituitary gland
      5. mammillary bodies (relay from limbic system to thalamus)
         a. emotional response to odors
         b. memory
II. Limbic System
   A. Nuclei and fiber tracts
      “ring around the brainstem”
      close association with hypothalamus
      1. cingulate gyrus (cortex)
      2. amygdala
      3. hippocampus

   B. Center for emotional drives

   C. Separated from cerebral cortex

   D. Limbic circuits
      1. after-discharge
         - continuous neuron firing after stimulus ends
      2. controls certain behaviors
         a. aggression & fear --> amygdala, certain parts of hypothalamus
            b. feeding/satiety
            c. sex
            d. rewards/punishments

III. Memory
   A. Localized to several different regions
      1. new transmission pathways
      2. facilitates transmission across existing synapses

   B. Short-term
      1. duration up to a few hours
      2. reverberating circuits?

   C. Long-term
      1. stored in cerebral cortex
         a. verbal in left hemisphere
         b. visuospatial in right
      2. particular aspects stored in different regions of cerebrum
      3. prefrontal lobe (cortex)
         a. retrieves various parts of memories to “construct” the whole
         b. retrieval and indexing
4. declarative memory
   facts and events

5. procedural memory
   a. unconscious habits or tasks
   b. conditioned reflexes (behaviors)