Introduction To Psychology

Biological Foundations of Behavior
Chapter 3

The Nervous System

- Functions of the Nervous System

1. Processes incoming information
2. Integrates incoming information
3. Influences and directs reactions to incoming information.

Central Nervous System (CNS)

- Brain
- Spinal Cord

Peripheral Nervous System

- Somatic System
- Autonomic Nervous System (ANS)
- Sympathetic Nervous System (SNS)
- Parasympathetic Nervous System (PNS)

Sympathetic Nervous System

- Dilates pupils
- Inhibits tears
- Inhibits salivation
- Activates sweat glands
- Increases respiration
- Increases heart rate
- Stimulates glucose release
- Relaxes bladder
- Inhibits elimination
- Inhibits genitals
- Releases adrenaline
- Inhibits digestion

ParaSympathetic Nervous System

- Constricts pupils
- Stimulates tears
- Increases salivation
- Decreases heart rate
- Constricts blood vessels
- Decreases respiration
- Stimulates digestion
- Contracts bladder
- Stimulates elimination
- Stimulate sexual arousal

Neuron Anatomy

- Soma
- Nucleus
- Dendrite
- Myelin Sheath
- Aborizations
- Terminal Buttons
- Axon
- Axon Hillock
- Receptor cells / sensory neurons
- Effector cells / motor neurons
- Interneuron
- Synapse
- Neurotransmitters

Neurotransmitters

- Antagonists:
- Agonists
- Acetylcholine (Ach)
- Dopamine (DA)
- Gama-aminobutyraic acid (GABA)
- Glutamate (Glu)
- Norepinephrine (NE)
- Serotonin (5-HT)of the

Three Main Divisions of the Brain

Hindbrain
Midbrain
Forebrain

Brain Anatomy

- Corpus Callosum
- Thalamus
- Hypothalamus
- Pituitary
- Hippocampus
- Amygdala
- Medulla
- Cerebral Cortex
- Frontal Lobe
- Parietal Lobe
- Occipital Lobe
- Temporal Lobe

Principles of Function

- Contralaterality:

  The receptor and control centers for one side of the body are in the opposite hemisphere of the brain.

Principles of Function

- Hemispheric Specialization:

  Different brain functions tend to rely more heavily on one hemisphere or the other.

  Example: The left hemisphere controls language for most right-handed people.

Split Brain Research

- Sperry -- severed corpus callosums of people with severe epilepsy.
- How does Sperry's research support the idea that the left hemisphere processes language?

Roger W. Sperry

- The Nobel Prize in Physiology or Medicine 1981
- Each hemisphere is "indeed a conscious system in its own right, perceiving, thinking, remembering, reasoning, willing, and emoting, all at a characteristically human level, and . . . both the left and the right hemisphere may be conscious simultaneously in different, even in mutually conflicting, mental experiences that run along in parallel."

Monitoring the Brain

- PET (positron emission tomography)
- MRI (magnetic-resonance imaging)
- fMRI (functional)
- CAT (computerized axial tomography)
- EEG (electroencephalograph)

The Endocrine System

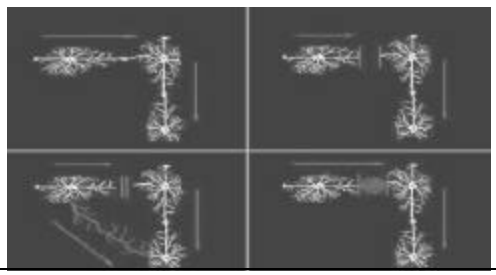
- Adrenal cortex: steroids
- Adrenal Medulla: adrenaline noradrenaline
- Gonads/Ovaries: estrogen,progesterone,testosterone
- Hypothalamus: neurosecretions
- Pancreas: insulin, glucagon
- Pituitary gland: prolactin, oxytocin , corticotrophin
- Thyroid gland:thyroxine, calcitonin

Central Nervous System Injury, Plasticity and Repair

- Collateral Sprouting
- Substitution of Function
- Neurogenisis
- Brain Grafts

Growth and Learning

- Appropriate Axonal Regeneration



The Brain and Drugs

- Marijuana
- Cocaine
- Heroin
- Alcohol

Genetic and Evolutionary Blueprints of Behavior

- Chromosomes
- Genes
- DNA
- Polygenic Inheritance
- Human Genone Project