PHYSIOLOGICAL MECHANISMS AND NEUROPSYCHOBEHAVIORAL SYSTEMS - I, II

Genetics
Early Experiences
Life Space
Learning
Expectancies

I. Why Study Physiological Mechanisms?

- A. Basis for All Behavior and Experience: Set Limits on Potential
- B. Basis Underlying Many Changes Throughout Life Span
- C. Basis for the Interaction of Experiences, Thoughts, Behavior, Illness, and Health

II. For Complex Organisms to Survive They Need Ability to:

- A. Monitor Internal and External Environments
- B. Integrate Information Obtained--Past and Present
- C. Act Back on Internal and External Environments to Maintain Best Possible Conditions for Survival

III. Homeostasis -- The Concept & Some Mechanisms

- A. Mechanisms for Maintaining a Relatively Stable, Near Optimal, Internal Environment
- B. To do this, need: Sensors; Producers; Feedback Systems

IV. There are Three Communication Systems which carry out the information collecting and processing necessary to do II and III. These three systems continually interact. Concept: Messenger Molecules.

- A. The Endocrine System
  1. Basic Characteristics: slow; diffuse; baseline setting
- B. The Immune System
  1. Basic Characteristics; key role is identifying and eliminating "not me" cells and molecules in body
- C. The Nervous Systems
  1. Basic Characteristics: fast; specific; responsive
  2. Thoughts as one action of the brain

WHAT YOU SENSE, WHAT YOU DO, AND WHAT YOU EXPERIENCE IN THOUGHTS AND FEELINGS, HAS TO BE REPRESENTED IN YOUR BRAIN. YOUR BRAIN LIMITS YOUR SENSATIONS, BEHAVIORS, THOUGHTS, AND FEELINGS

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V. Focus on the Brain

A. Nerve Cells and Information Integration
B. Specialization and Generalization
C. Nature - Nurture
D. Brain is organized to provide structure to the world in which it has evolved
E. The Mind as the Functions of the Brain

6. Concepts: Redundancy; Plasticity; Neurogenesis

VI. Reward Systems

A. Jim Olds and Rats
B. Medial Forebrain Bundle
C. Periventricular System
D. Jose Delgado and Humans

VII. Sexual Differentiation. The biological basis of male-ness and female-ness, Interfaces Between the Brain and the Endocrine System: The Hypothalamo-Hypophyseal-Portal Link

A. Genetics and Sexual Behavior -- Guinea Pigs, Humans
B. Basic Process of Differentiation -- Critical Period, Testosterone and Androgens
C. Differentiation of the Reproductive System
D. Differentiation of the Nervous System
E. Behavioral and Psychological Effects and Implications

VIII. Stress, Stimulation, Growth, Learning, Aging

A. Studies in rats, nonhuman primates, and humans
B. The Hypothalamus-Pituitary-Adrenal Cortex System
C. The Hippocampus and learning and memory
D. The data