

## VI. EXERCISE, the fourth determining force in Constructive Hygiene

### A. BRIEF DISCUSSION OF THE ANATOMY AND PHYSIOLOGY OF THE NEURO-MUSCULAR (MENTI-MOTOR) MECHANISM.

1. The Muscular System: Evolution of the system; relation to evolution of other systems and to development and conditioning of these systems. Forms 41% ( $\pm$ ) of total body weight; most active of tissue cells in demand for nutrients and in transforming potential into kinetic energy; muscle activity produces most profound changes in environment of all tissue cells; some of the general effects of muscular activity on the muscles and on other systems: e.g., circulatory; respiratory; alimentary or digestive; excretory; heat regulatory; nervous.

2. Kinds of Muscle Tissue Cells, and where found in body.

- a. Skeletal, Striated, or Voluntary Muscle.

Location: Attachment to bones; fasciae; tendons, structure of the voluntary muscle cell; sarcolemma fibrils; sarcoplasm; blood supply; connection with nervous system; sensory and motor nerve endings in muscles.

Functions of Skeletal Muscles: Connection with motion and locomotion; relation to posture; production of body temperature; storage and oxidation of glycogen; production of lactic acid and  $\text{CO}_2$  during activity; relation to respiratory movements and to certain excretory functions.

- b. Smooth, or Involuntary Muscles

Found in walls of alimentary canal; walls of blood vessels, bladder; ducts from glands, uterus, etc.; structure and characteristics; effects of voluntary muscular activity on these structures.

- c. Cardiac, or Heart Muscle

Structure and characteristics of the cells; compare with cells of smooth and striated muscle; characteristic of rhythmic contractability; control of rate through nervous system; chemical factors which influence rhythm; "all or none" theory of contraction.

### B. THE NERVOUS SYSTEM

Anatomical and physiological considerations.

1. The great coordinator of all bodily activities; relation to neuro-muscular (menti motor) mechanism: one unified system, but divided for purposes of discussion and understanding; the neurons, or nerve-tissue cells; characteristic forms of these cells; specialized to receive, transform, or transmit stimuli, affector, effector, and association neurons within the system.

2. Main Divisions of the Nervous System

- a. Central (or Cerebro-Spinal) includes cerebrum, cerebellum, medulla, and spinal cord.