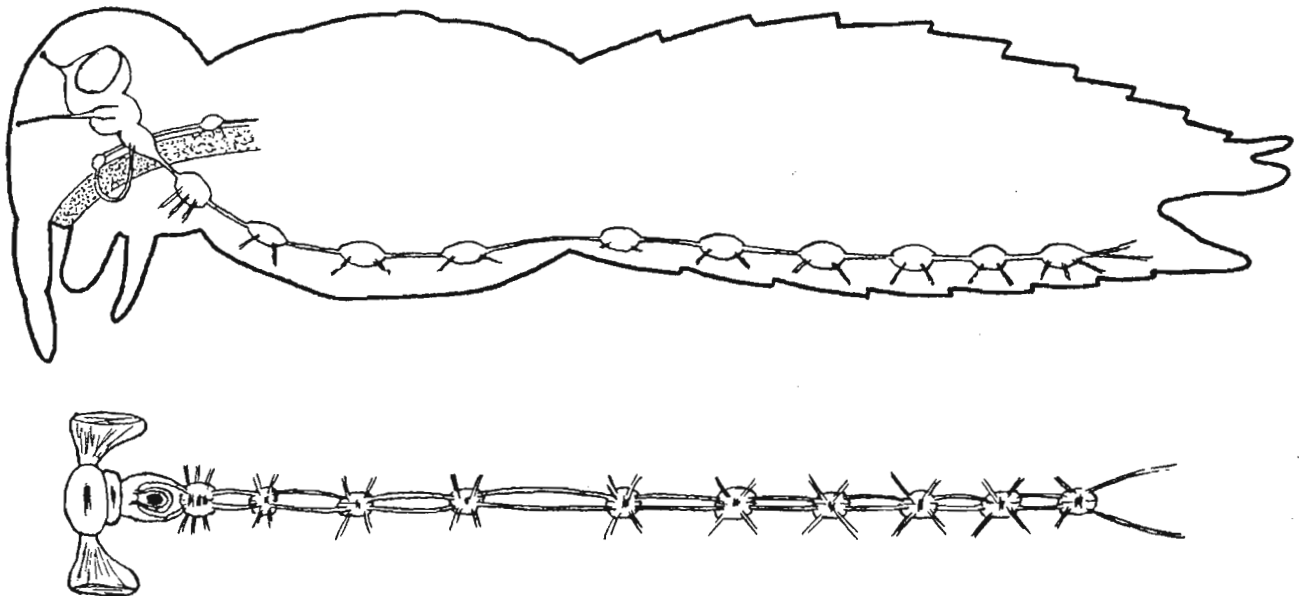


Lecture Outline

INSECT BEHAVIOR

I. The Nervous System

- A. Neurons -- nerve cells
 - 1. sensory -- afferent
 - 2. motor -- efferent
 - 3. association -- internuncial
- B. Primitive Ladder-like Nervous Systems
 - 1. ganglia
 - 2. commissures
 - 3. connectives
- C. Insect Central Nervous System (CNS)
 - 1. brain -- proto-, deuto-, tritocerebrum
 - 2. subesophageal ganglion
 - 3. circumesophageal commissure and connectives
 - 4. innervations
- D. Ventral Nerve Cord
 - 1. segmental ganglia
 - 2. commissures and connectives
 - 3. innervations
- E. Stomodaeal Nervous System
 - 1. frontal and hypocerebral ganglia
 - 2. recurrent nerve
 - 3. innervations



II. The Senses

A. Mechanoreceptors

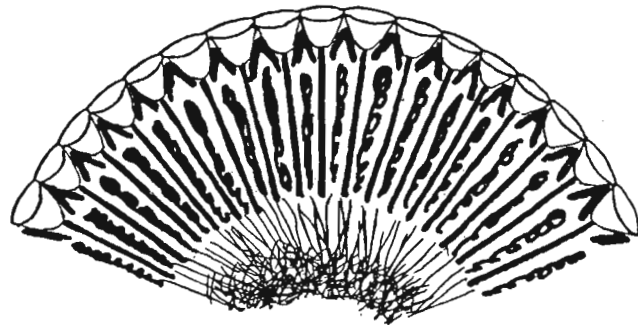
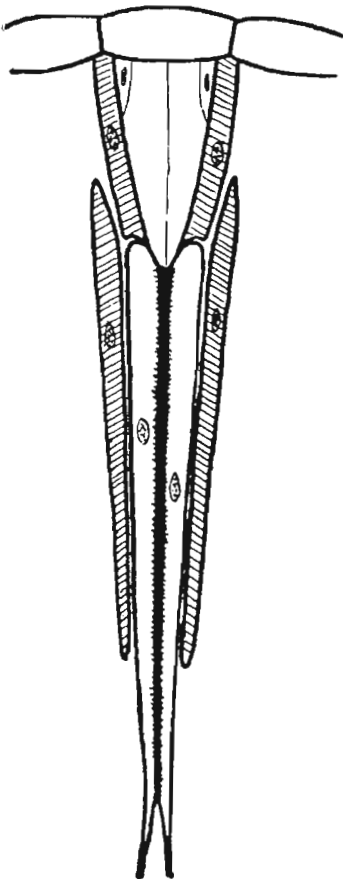
1. tactile
2. proprioceptive
3. auditory

B. Chemoreceptors

1. contact chemoreception - gustation
2. remote chemoreception - olfaction
3. receptor sites

C. Photoreceptors

1. compound eyes
 - a. dioptric apparatus
 - b. receptor apparatus
 - c. mosaic vision
 - d. visual perception
2. ocelli
 - a. lateral ocelli -- stemmata
 - b. dorsal ocelli



III. The Nature of Insect Behavior

- A. Innate behavior -- instinct
 - 1. reflexes
 - 2. orientation behaviors
 - a. kinesis
 - b. taxes
 - c. dorsal light reaction
 - d. light-compass reaction
 - 3. fixed action patterns
 - a. key stimuli - releasers
 - b. appetitive behavior
 - c. consummatory act
- B. Learned behavior
 - 1. habituation
 - 2. conditioning
 - 3. instrumental
 - 4. imprinting
- C. Complex behavior
- D. Development and Evolution of Behavior

IV. Periodic Behavior

- A. Activity cycles
 - 1. circadian -- diurnal, crepuscular, nocturnal
 - 2. circalunar
 - 3. circannual
- B. Entrainment
 - 1. exogenous cues -- zeitgeber
 - 2. endogenous systems -- biological clock

V. Communication

- A. Functions of communication
- B. Sensory modalities
 - 1. tactile
 - 2. gustatory
 - 3. olfactory
 - a. pheromones
 - b. kairomones
 - c. allomones
 - 4. auditory
 - a. sound signals
 - b. sound production
 - 5. visual
 - a. visual signals
 - b. light production - photogenic organs

VI. Social Insects

- A. Levels of sociality -- evolution of caste
- B. Isoptera -- Termites
 - 1. workers = pseudergates
 - 2. soldiers
 - 3. reproductives
- C. Hymenoptera
 - 1. ants
 - a. reproductives
 - b. workers
 - 2. bees
 - a. reproductives
 - b. workers
 - c. pollination