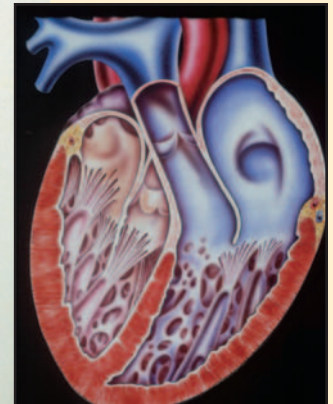
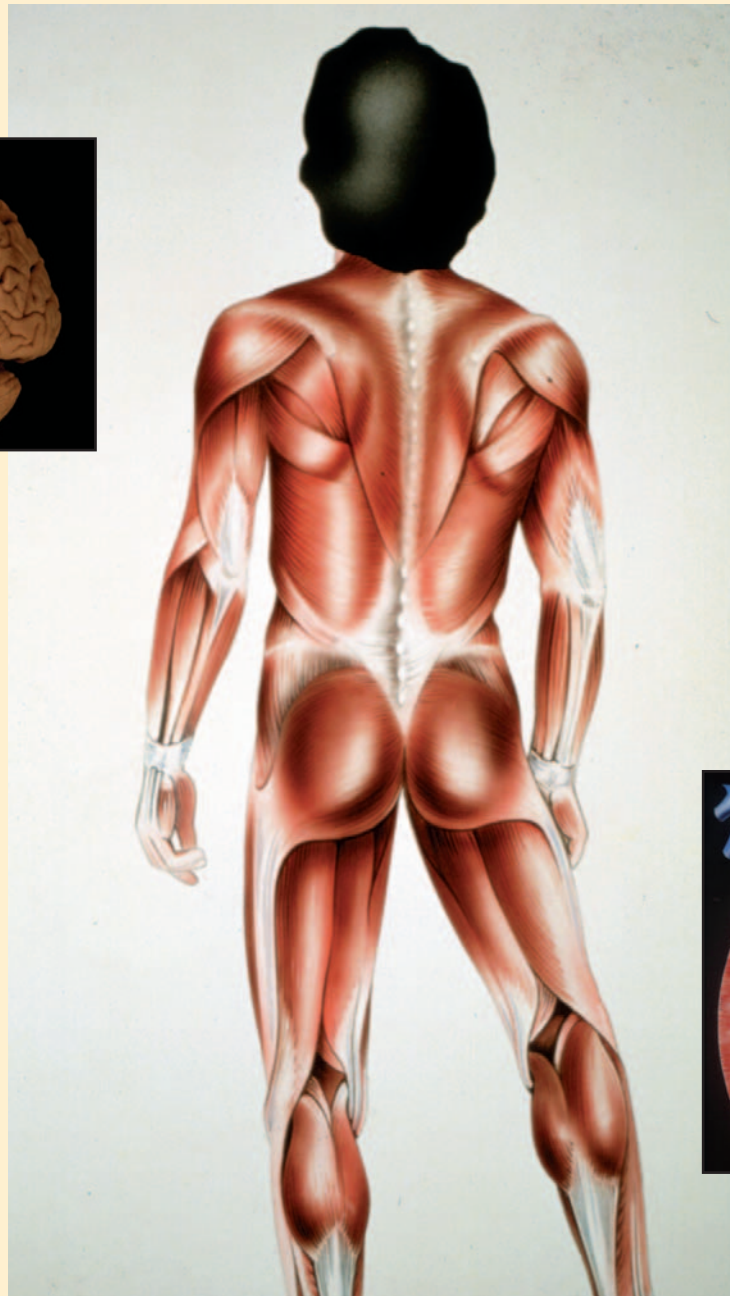




The Living **BODY**

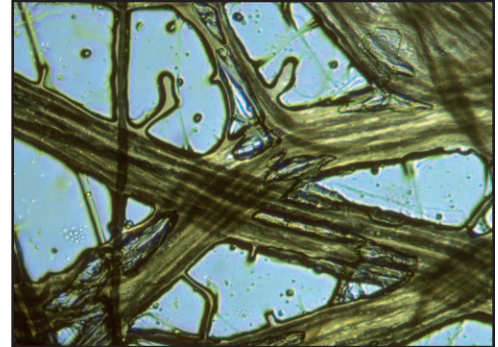
FILMS FOR THE
HUMANITIES &
SCIENCES®



Nerves at Work

Summary

This program focuses on the network of nerves that extend through the body from the brain and spinal cord. It includes detailed segments on involuntary and reflex nerve actions, the chemical and electrical properties of nerve impulses, and their transmission through nerve fibers. Scenes from a day spent at a race track by a family, and the minor mishaps they encounter there, dramatize the body's capacity for protective, involuntary nerve reflexes.



The nervous system is in part composed of a complex system of cables, or bundles of nerve fibers that carry signals between the body's cells. Every task in the living body depends on these nerve impulses. The involuntary nerves control the daily maintenance tasks that keep the body operating smoothly and efficiently. Groups of these nerve cells link up in small networks down the side of the spinal cord and control the activities of many organs. The nerves controlling the body's automatic reflexes meet at junctions alongside the spinal cord. Many of these reflexes start with sense messages that are triggered when specialized nerve endings in the skin or sense organs are stimulated.

The messages carried in nerve fibers are really waves of chemical change produced by tiny electrical currents generated by the nerve cells. These waves of chemical changes vary in a systematic way, creating a succession of impulses which all have nearly the same voltage. Nerves carry complex information by changing the rate at which they transmit impulses: a light pressure or a quiet sound might be conveyed at a slower rate than a heavier pressure or louder sound, which would produce more rapid nerve firing. The speed at which a nerve impulse travels depends on the type of nerve. Nerves come in different thicknesses, with the thicker ones carrying faster impulses than the thin ones. The transmission of nerve messages from one nerve cell to the next is accomplished by small molecules that are released from nerve endings and flow across the slight gap separating the nerve membranes and trigger an impulse in the nerve cell.

Objectives

1. To explain voluntary and reflex nerve activity.
2. To describe how nerve impulses are transmitted through individual nerve cells by waves of chemical changes.
3. To show how nerves carry complex information by changing the rate at which impulses are transmitted.
4. To examine how the speed of nerve impulse transmissions is often determined by the thickness of the nerve cell.
5. To illustrate how messages travel between nerve cells by molecules in nerve endings.

Recall Questions

1. List some of the internal activities controlled by involuntary nerves.
2. Explain the sequence of events that occur when the knee-jerk reflex is triggered.
3. Explain what is meant by the “all-or-none” law in terms of transmitting impulses within a nerve cell.
4. Describe how messages are transmitted from one nerve cell to the next.

Interpretive Questions

1. How would life be altered if the body did not have automatic reflexes?
2. Why do you think the nerves do not transmit impulses at the same speed?
3. Describe a recent experience that triggered an automatic reflex in your body.

Vocabulary Required for Effective Viewing

- cells
- involuntary
- nerve impulse
- nerves
- reflex action
- sense detectors
- spinal cord



WWW.FILMS.COM

Copyright © 1985 Films for the Humanities & Sciences® • A Films Media Group company
PO Box 2053 • Princeton, NJ 08543-2053
800-257-5126 • Fax 609-671-0266