



The Living
BODY

FILMS FOR THE
HUMANITIES &
SCIENCES®



Dream Voyage

Summary

An ocean cruise for a couple and their young child provides the setting for this study of sleep. A profile of the sleep state is sketched through analysis of brain wave activity, observation of physical movements of the sleeping body, and an examination of the functioning of the autonomic nervous system.



During wakefulness, brain cells produce beta waves—rapid and irregular electrical impulses that move at random; during sleep, brain waves become more rhythmic as electrical activity slows down. In the first stage of sleep the brain produces alpha waves; at this stage, which lasts about 15 to 20 minutes, sleep can be easily disrupted. The deepest phase of sleep is signified by delta waves, the slowest type of brain wave. Waves of electricity wash over the brain's surface two or three times per second. A computer graphic of the human brain in deep sleep displays patches of bright colors pulsing rhythmically over it, from one end to the other.

In the course of a night, deep sleep is punctuated three or four times by 20- to 30-minute periods of Rapid Eye Movement (REM) sleep, when the brain seems to burst into life while the body below the neck becomes nearly paralyzed. During REM sleep, the eyes begin to move rapidly (hence the name), more blood flows to the brain, breathing becomes shallower, and the heartbeat can become less regular. It is during REM sleep that dreaming occurs.

The autonomic nervous system regulates many body functions in the way automatic pilot guides the ship. Thus digestion, breathing, circulation, the maintenance of constant body temperature, and the body's many chemical activities (like the secretion of growth hormone) continue uninterrupted during sleep. Part of the brain remains vigilant during sleep. Only those messages indicating danger, or some other urgent news, are allowed to penetrate; everything else is filtered out.

Images in dreams are usually based on events of the day before. Fears, worries, and hopes are translated into realistic sights and sounds in the brain. Many animals experience periods of REM sleep and also dream. Remarkable footage shows a sleeping cat apparently acting out its dreams. In this experiment, the normal REM-period paralysis has been bypassed by severing some of the cat's nerves. As a result, the cat's brain shows all the signs of REM sleep while its muscle activity suggests an exciting dream life chasing flies and mice.

The likeliest explanation of the need for sleep is that sleeping provides the body with the opportunity for construction or repair. Dreaming appears to be almost as important, perhaps because it enables the mind to sort through the experiences of the day.

Objectives

1. To examine what happens to the body during sleep.
2. To describe brain wave activity in states of wakefulness and sleep.
3. To explain the functioning of the autonomic nervous system during sleep.
4. To study the effects of REM sleep on the brain and the rest of the body.
5. To explore the reasons why sleeping and dreaming are necessary parts of our lives.

Recall Questions

1. Name the three stages of sleep, and describe the brain wave activity of each stage.
2. How much sleep do humans need?
3. During what phase of sleep can sleepwalking occur?
4. Why are we effectively paralyzed while dreaming?

Interpretive Questions

1. Can you think of other reasons for our need to sleep other than providing the body with the opportunity to repair itself?
2. If a person does not remember dreaming, does that mean that he or she did not dream? Why do you think dreams are sometimes remembered and sometimes forgotten?
3. Imagine what life would be like if our conscious brain had to control the internal functions regulated by the autonomic nervous system.

Vocabulary Required for Effective Viewing

- autonomic nervous system
- beta, alpha, and delta waves
- consciousness
- deep sleep
- REM sleep
- unconsciousness



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