

Dreaming Is Ancient Tool

► DREAMING may have originated as a tool of survival 100 million years ago with the emergence of mammals, a noted authority on sleep has theorized.

Dr. Frederick Snyder, chief of the section on psychophysiology of sleep at the National Institute of Mental Health, Bethesda, Md., has brought much current evidence on sleep to support his evolutionary theory of dreaming.

All mammals so far studied "dream," or rather exhibit the REM (Rapid Eye Movement) stage of sleep in which dreaming takes place.

REM sleep is a highly excited state.

Since such intense nervous excitation exists in so many mammals from the rat to the human, Dr. Snyder reasons that its origin must go back millions of years to a common ancestor.

Further support for the theory comes from study of the opossum—an animal that has been dubbed "a living fossil." Since it first appeared on earth during the age of the dinosaur, this primitive mammal has changed hardly at all. The opossum spends about one-third of its 18 to 20 hours of sleep in REM, noted Dr. Snyder.

Such an ancient phenomenon, as dreaming sleep appears to be, should have value for survival.

Almost every REM period is followed by some degree of awakening in both man and animals, Dr. Snyder said. If an animal is in a familiar, secure environment, however, sleep continues and the animal never knows he was close to waking several times during the night.

But if the animal is frightened by the strangeness of a laboratory, for instance, he will awake fully after shortened REM stages. The same seems to be true of humans. Recent studies have shown that depressed or worried people often wake up in the middle of a REM period.

Perhaps these unique periods of intense excitation—REM sleep—have served a "sentinel" function down through the ages, Dr. Snyder said. In other words they might be preparing the deeply sleeping and inactive animal for immediate alertness, enabling him to flee from predators the moment he opens his eyes. Evidence is beginning to show that when the animal awakes from any other stage of sleep, he is dopey, confused and vulnerable.

The most defenseless animals, like rabbits, sleep fitfully and have little REM sleep. This may seem paradoxical, Dr. Snyder said, until one discovers that REM is replaced by full awakening. Continuous sleep simply is not consistent with danger and so the animal awakes after a very abbreviated REM stage.

Thus, dream time may be a line of defense second only to full awakening. When danger is absent, dream time leads back into deep sleep; when danger is present, it gives way to full alertness.

As to whether lower animals dream in a human sense, Dr. Snyder dismissed the question as a pseudo-problem. Obviously animals probably do not experience the same complex imagery as humans do, but they may very well have an "amorphous riot of sensations."

How complex and organized those sensations are has little to do with the fact that dogs, cats, sheep, rabbits, mice, monkeys, etc., show the same periodic excitation of mind and body during sleep as humans.

Despite the array of evidence and the convincing manner in which it all fits into an evolutionary theory, Dr. Snyder emphasized that he has probably "very much oversimplified" the dreaming state.

So complex is this aspect of mammalian life, that it most likely serves more functions than survival alone, just as the waking state has a larger purpose than the preservation of life.

Dr. Snyder's thesis was published in the *American Journal of Psychiatry*, 123: 121, 1966.

PHYSIOLOGY

Anxiety Slows Response

► PART of what has been termed a "learning deficit" in elderly people is not reduced capacity to learn but slowness to respond under pressure, a Duke University researcher said.

Older people are more anxious than the young when faced with the necessity of learning something, said Dr. Carl Eisdorfer, assistant director of the Duke Center for the Study of Aging and Human Development. Their anxiety inhibits their speed of performance. But when the pressure is off, said Dr. Eisdorfer, the elderly learn as well as younger people. At least the ones in his study did.

The Duke scientist compared the speed of word recall in two groups, divided by age. He flashed words on a screen and then gave his subjects four seconds to recall a particular word. The young, as expected, scored higher than the old.

But when the older subjects were given 10 seconds to respond, their scores went up dramatically, he said, making their answers almost as accurate as those of the younger group. The initial low scores were caused not by mistakes but by a failure to respond at all. The test included some 70 people in all.

Site of Seizures May Be Spotted With Computer

► SEVERE epilepsy that does not respond well to drugs may be attacked by computers in combination with surgery.

The Vocational Rehabilitation Administration (VRA) announced it has awarded \$67,678 to the University of California to study whether or not computers can be used in pinpointing the exact location of brain malfunction.

Once located, the malfunctioning pathways can be interrupted by surgery and the epileptic attacks blocked.

In its announcement, the VRA said the computers would register information coming from electrodes implanted in the patient's brain. By reading the computer, the surgeon might then be able to spot the site of "electrical storms" which cause epileptic seizures.

The research is aimed at 15% of epileptics who experience so many seizures they can work only under sheltered work-shop conditions.

The other 85%, said the VRA, is usually treated successfully with drugs and the patients are able to work at normal jobs.

The research will be carried out by the University of California's School of Medicine in San Francisco.

While he tested the two groups, Dr. Eisdorfer also measured physiological responses and discovered a correlation between the test situation and body function.

He found that the level of free fatty acids in the bloodstream—an index of anxiety—followed a different pattern in the old than in the young.

FFA level in the younger group rose quickly at the beginning of the word test, hit a peak just before performance, and then dropped immediately.

But in the older group, the FFA level was higher to start with, said Dr. Eisdorfer. It then rose slowly and peaked several minutes after the test was over. He said heart rates followed the same pattern.

High performance in learning takes a greater physiological toll on older people, Dr. Eisdorfer said. This leads to an emotional defensiveness by which they simply refuse to perform.

If the autonomic nervous system which controls physiological stress can be blocked, Dr. Eisdorfer believes the "learning deficit" may be greatly reduced in elderly people. He is now engaged in a study with the drug, Enderol, which blocks autonomic functions without tranquilizing the patient.