

## PHYSIOLOGY

# '...Perchance to Dream'

► PEOPLE MAY ACQUIRE voluntary control over sleep and exotic new sleeping habits as a result of new directions in sleep research.

These and other striking advances made toward understanding sleep have been detailed in a monograph published by the National Institute of Mental Health (NIMH), Bethesda, Md.

NIMH is currently spending \$2 million on sleep research. One aim is to investigate the possibility of voluntary control over sleep. If people can learn to sleep and wake at will, then they should also be able to gain control over unconscious vital functions like respiration, heart beat and blood pressure.

Indeed, some very recent experiments indicate that people can be taught to identify brain waves called alpha rhythms while they experience them. Alpha rhythms occur most often during sleep.

Not only did subjects become aware of alpha waves, they inadvertently learned to control them during the tests reported by NIMH.

The research was linked by NIMH to the mysterious self-discipline practiced by Yogis and Zen Buddhists. Yogis have been known to quiet their heart beats to a point below detection with modern instruments. Zen Buddhists can initiate alpha rhythms during meditation.

One aim of sleep research is to discover whether man can find better sleep patterns, such as sleeping four hours and working four hours in alternating cycles.

Human beings are not necessarily bound to a rigid eight-hour sleep cycle. Evidence now illustrates the importance of early training in establishing sleep habits. Moreover, the habits are not only psychological. They

become "imbedded in the organization of the central nervous system and in the biochemical timing of the body," states the report.

Beside this, humans move through sub-cycles—fluctuations in body temperature and mental activity—every 90 to 120 minutes, day and night. Further study of these should illuminate the search for the best and most efficient sleep habits.

"In the next decades people may learn how to induce and terminate sleep at will, establish more effective schedules of work and rest, perhaps even reducing the normal sleeping time," stated the report. "In our exploration of the mechanisms governing sleep and the capacities of the sleeping person, the door is opening upon the amplitude, the unexploited richness, of man's consciousness."

In addition to these possibilities, the 125-page monograph, *Current Research on Sleep and Dreams*, also touched on new findings in dreaming.

Scientists have known for some time that dreaming is an active state. But not even Hamlet would have suspected the disorders that can take place during dreaming.

Epilepsy, asthma and heart failure may occur while a person dreams, leading to speculation that violent dreaming causes such attacks.

Recent evidence does, in fact, indicate that dreaming can be dangerous. Though overall heart rate and blood pressure decrease steadily from the first moment of sleep, they have been found to fluctuate widely during the dream state.

On occasion these fluctuations followed "an erratic pattern that . . . sent blood pressure above any levels observed during the quiet waking period before sleep," said the report.

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## PHYSIOLOGY

# X-Rays Perceived by Rat

► A RAT apparently senses radiation from X-rays as it does a flash of light or a pungent aroma.

The radiation is perceived, most likely, by the smell area of the brain, or the olfactory system, said Dr. John Garcia, at the Massachusetts General Hospital in Boston.

Drs. Nathaniel Buchwald and C. D. Hull of the University of California's Brain Research Institute in Los Angeles have been studying the rat's perception of radiation for several years with Dr. Garcia. Much of their work was carried out at the Long Beach Veterans Administration Hospital.

The doctors tested several different sections of the rat brains with direct application of X-ray beams. They found that response "peaked" at the olfactory system, in other words, brain wave changes were more pronounced there.

When olfactory bulbs were removed from the rats, the animals became much less

sensitive, said Dr. Garcia.

The rat's ability to sense X-rays, however, is not a typical sensory activity. Apparently the animals do not smell radiation. When their sniffing apparatus was blocked by tracheal tubes, the rats still registered perception of X-rays.

In his original experiments, Dr. Garcia demonstrated another reaction to X-rays. He found that if radiation were directed at the animal's abdomen, it appeared to be a noxious stimulus. The animal would try to avoid food or places it associated with X-rays. This effect was a delayed, cumulative one, dependent on total dosage.

Dr. Buchwald likened these two effects of radiation to those of alcohol. When a human drinks an alcoholic beverage, he immediately detects the alcohol by taste and smell. There may be a later cumulative, noxious effect or hangover.

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## PUBLIC HEALTH

# Too Much Money Leads To Teen-Age Drunkenness

► AS A RESULT of increased spending money, teen-agers are engaging in excessive drinking, Dr. G. M. Carstairs, professor of psychological medicine, at Edinburgh University, observed in a book published in Edinburgh, Scotland.

He found that some people still in their 20s are presenting the clinical picture of severe alcoholism. Formerly alcoholism was especially associated with poverty and squalor, but now it has spread to the more wealthy.

The average family spends under two dollars a week on drink, about four percent of its weekly expenditure. In an alcoholic's house the proportion could easily become 10 times as much.

The World Health Organization has estimated that there are 350,000 alcoholics in Britain, a quarter of whom show physical and mental deterioration. Whatever the true figure, social and medical services fall far short of requirements.

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## SOCIOLOGY

# Two Million Workers Affected by Alcoholism

► ALCOHOLISM costs U.S. business more than a billion dollars yearly by affecting at least two million workers.

A New York Academy of Sciences meeting on alcoholism and obesity heard this from Dr. Luther A. Cloud of the Equitable Life Assurance Society, New York.

Rehabilitation is especially effective in an industrial setting, said Dr. Cloud. Stricken employees often have stable lives, except for the drinking. They have maintained their marriages, raised children, attended church and kept the respect of the community.

Because it can see the problem not as one of isolated individuals but as a larger condition, industry can and must play a more important role in the prevention of deviant drinking, he said.

An unusual clinical study in which alcoholics were allowed to drink as much as they could earn was reported by Drs. Jack H. Mendelson and Nancy K. Mello of the Massachusetts General Hospital and Harvard Medical School, Boston, Mass.

The alcoholics drank for 12 to 20 days, maintaining a constant high blood alcohol level but showing only moderate intoxication. At first they worked for their drink during the day and early evening. As the experiment progressed they began working around the clock and sleeping intermittently for only one or two hours at a time.

Drinking stopped abruptly and voluntarily. Seldom was cessation related to illness or severe inebriation. No alcoholic slacked off slowly to avoid withdrawal symptoms.

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