

PSYCHOLOGY

Sleepwalkers Wander When Not Dreaming

► THE LONG-HELD IDEA that sleepwalking may be the acting out of a dream has been challenged by researchers.

Using special equipment to record the brain waves of eight continuously sleeping sleepwalkers in a laboratory at the University of California at Los Angeles, the researchers found that in every case the sleepwalking began during deep, dreamless slumber.

Activity of the somnambulists ranged from sitting up and moving about in bed to actually walking around the laboratory. As previously reported by others, the sleepwalkers walk with their eyes open and avoid furniture and other obstacles as they move about.

Invariably they remember nothing if awakened, although during the incidents they may perform complex acts that last for several minutes.

Forty sleepwalkers were interviewed by Drs. Allan Jacobson, Anthony Kales, Dietrich Lehmann and J. R. Zweizig of ULCA's departments of anatomy and psychiatry, who made a preliminary report on the eight subjects selected.

Sleepwalking appears to occur more frequently among young children, especially boys, than among adults. Six percent of all persons have probably sleepwalked at some time or another, and one to three percent of children sleepwalk frequently.

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GEOLOGY

Underground Storage For Radioactive Wastes

► RADIOACTIVE WASTES from a nuclear fuel plant could be safely stored for hundreds of years in crystalline rock more than 1,000 feet beneath the earth's surface in South Carolina, a geologist told members of the Geological Society in Washington, D.C.

Storage tunnels could be carved through the rock and the radioactive by-products confined for more than 600 years, the period of time needed to make the wastes harmless, reported Wendell Marine, geologist and ground water specialist of the Department of Interior's Geological Survey.

The ground water movement, rock structure and the layers of clay and loose rock beneath the Atomic Energy Savannah River Plant near Aiken, S.C., are very favorable for storing the "high-level" radioactive wastes produced from processing nuclear fuels, he said.

Ground water is defined by geologists as the water from rain, rivers and other sources that has infiltrated down through the soil and saturated a lower level of the ground.

Moving under force of gravity, this water fills all pores, fractures and openings in the rock and soil. The upper level of this area of ground water is called the water table. Above this level lies drier or aerated ground.

The crystalline, metamorphic rock of the area makes a good storage place for several

reasons, Mr. Marine said. For one thing, the movement of ground water through the rock is very slow, only about one and a half to seven feet per year, depending upon how much the rock was fractured.

Second, a "protective layer" of clay lies between the crystalline rock and the looser materials of broken rock and clay above, he said. This clay is about 50 feet thick and is practically impermeable to water. It thus would act as a barrier to prevent radioactive solutions from below seeping upwards.

A third factor of safety is that even if some of the radioactive wastes such as strontium and cesium should seep into the overlying materials, they would be "held" by natural chemical reaction with the clay and become immobilized.

The two-and-a-half year investigations of the local rock formation and water movement, sponsored by the Atomic Energy Commission, were undertaken by the Geological Survey, the Army Corps of Engineers and the Du Pont Company.

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MEDICINE

Scientists Track Disease By Stinging Mosquitoes

► RESEARCH SCIENTISTS are stinging mosquitoes with tiny germ-charged needles as they try to track down a new disease mystery.

They believe that mosquitoes, in addition to carrying malaria and dengue fever, are spreading polyarthritis.

Polyarthritis is similar in symptoms to rheumatic fever or the early stages of rheumatoid arthritis. It causes inflammation of several joints and extreme pain.

Research into the part suspected to be played by mosquitoes in transmitting polyarthritis is being conducted at the Queensland Medical Research Institute, Brisbane, Australia. The institute's director, Dr. R. L. Doherty, said, "We're not sure about a lot of things connected with the mosquito and this disease, but we are very suspicious."

Polyarthritis epidemics have occurred in New South Wales, Queensland and Victoria. Dr. Doherty's staff last year discovered polyarthritis virus in a batch of mosquitoes caught in Townsville, Queensland, by scientists from the Sydney School of Tropical Medicine. The Doherty team now is trying to isolate the polyarthritis virus from the blood of people suffering from the disease.

Guinea-pig mosquitoes in the Queensland Medical Research Institute's laboratories are being "stung" with viruses from microsyringes. The needle is only three-thousandths of an inch in diameter.

The institute's entomologist, Harry Standfast, said the "shot" injected into the thorax of each mosquito is "equivalent to the force of four gallons of fluid being pumped into a human's chest through an inch pipe."

The researchers allow the mosquitoes to live from 10 to 15 days to incubate the disease. Then they either kill them and inject their blood into mice or allow live mosquitoes to bite the mice.

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IN SCIEN

MEDICINE

Pneumonia in Pregnancy Endangers Mother, Baby

► DANGER OF DEATH to the mother and baby from pneumonia during pregnancy has caused obstetricians to be wary even of the common cold.

This is the reason pregnant women are on the high priority list for flu vaccination, as pneumonia often follows flu.

A higher-than-usual rate of pneumonia in pregnant patients at Great Lakes Naval Hospital, Great Lakes, Ill., was reported by Dr. Herbert G. Hopwood Jr., who described 23 cases.

Of seven women whose babies were delivered while experiencing an acute attack of pneumonia, two died and their babies were stillborn.

All except one of the 23 women smoked an average of one pack of cigarettes a day, and 15 of the 23 had a previous history of upper respiratory problems such as asthma, pneumonia, bronchitis or multiple allergies.

Fortunately, antibiotics make the outlook more promising than in earlier periods. About half of the pregnant women who got pneumonia during the 1918 influenza epidemic, for example, died.

Treatment today includes penicillin, and, depending on the type of pneumonia, tetracycline, terramycin, staphicillin and chloromycetin, all given intravenously. Antihistamines are not advised.

General anesthetics should not be given during delivery to women with pneumonia, Dr. Hopwood said, and great care should be taken in giving respiratory depressants such as morphine or demerol. Oxygen should be given throughout labor and delivery, however.

Chest X-rays, with proper abdominal shielding, should be given during pregnancy, he added.

Dr. Hopwood spoke at the annual meeting of the Armed Forces Chapter of the American College of Obstetricians and Gynecologists, Andrews Air Force Base, Washington, D.C.

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NECROLOGY

Birds May Be Cause Of Fatal Plane Crash

► THE HALLOWEEN DAY airplane tragedy that killed U.S. astronaut Theodore C. Freeman may take "several weeks" to clear up, said Federal Space Agency officials.

However, feathers pulled from the wreckage indicate that Freeman's fast-moving T-38 jet trainer might have collided with low-flying birds.

His death is the first in the U.S. astronauts' ranks.

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CE FIELDS

ENTOMOLOGY

Viruses Mass-Produced For Infecting Insects

► SCIENTISTS are perfecting another secret weapon in the war against insects. They are now mass-producing certain viruses to infect and kill enemy insects.

C. M. Ignoffo, Agricultural Research Service entomologist in Brownsville, Texas, has perfected a method to mass-produce several insect viruses, including one that infects the cotton bollworm and the tobacco budworm.

Many of the nearly 200 known insect-attacking viruses could be produced in this way and be placed within reach of farmers at a reasonable cost.

In the virus production method, scientists feed clusters of virus particles encased in a tough many-sided body to larvae of the insect pests.

The viruses multiply at an almost unbelievable rate in the insect larvae, the entomologists stated. One larva produces anywhere from 6 to 24 billion virus bodies, which eventually kill the larva. The dead infected larvae are then processed to obtain a virus suspension which can be sprayed on field crops.

The virus produced in only 100 larvae can treat an entire acre of farmland, the scientists said. Insects on the treated crops consume the virus, become infected and produce new virus, which later disperses and kills other insects. However, the virus suspension must be sprayed over the crops at appropriate times so that the treatment will be coordinated with the life pattern of the insect.

This virus is highly selective, infecting only certain insects, and thus poses no danger to beneficial insects, animals or man.

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FORESTRY

Squirrels Cause Canker Sores on Maple Trees

► THE MYSTERIOUS CULPRIT that causes discoloration, knobs and even death to many red and sugar maples throughout New Hampshire has been found.

Red squirrels, *Tamiasciurus hudsonicus*, were caught in the act as they sank their teeth into the trees in early spring to drink the sweet sap, reported Alex L. Shigo, of the Northeastern Forest Experiment Station, Laconia, N.H., part of the Forest Service, U.S. Department of Agriculture.

After the bushy-tailed culprits have drunk their fill, many species of fungi, bacteria and yeasts infect the bite wounds, and cankers develop.

Local foresters who were alerted to watch the suspected red squirrels observed them taking several deep bites to reach the sap. A forester described one squirrel as being

in a "feeding frenzy," drinking sap and wildly biting the stems.

Cankers are particularly abundant at breast height and damaging on maple trees less than six inches in diameter, reported Mr. Shigo in the Plant Disease Reporter, 48:794, 1964. Although wounds were observed on maple trees from Durham, N.H., to areas in the northern White Mountains, other tree species in these areas did not seem to be affected.

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TECHNOLOGY

Red China Upgrades Technicians to Engineers

► FIVE HUNDRED technicians and workers have been promoted to engineers this year in Tientsin, North China's major industrial city. The number of promotions is greater than in any of the previous six years.

Most of the newly promoted engineers are recent college or secondary technical school graduates. The rest are experienced workers, the official New China News Agency reported. The engineers work in metallurgical, machine building, chemical, radio, textile and various other industries.

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GENERAL SCIENCE

Better Understanding Of Pesticides Urged

► MAN NEEDS a better understanding of the effects of pesticides on human health and welfare, Stewart L. Udall, Secretary of the Interior, warned.

The nation's biologists must play a key role in telling the people what is needed to protect our health and provide food, what it will cost, and what research is needed to make pesticides more effective and less harmful to wildlife, Mr. Udall said in BioScience, Nov. 1964.

We are just beginning to admit that we are part of the balance of nature, Mr. Udall points out.

"As we survey now the results of waning wetlands, persistent pesticides, smog-filled air and troubled water," he says, "we are facing the realization that only by working with nature in her ecological entirety will man realize his highest potential in the scheme of things."

As man begins to assess both the negative and positive sides of his actions and advances, he finds that a price is paid for each success.

For instance, automobiles have brought mobility and an urban way of life, but also smog. The removal of minerals from the earth have brought energy and materials, but left gaping landscapes and polluted streams. Insecticides and fertilizers protect man's health and give him food, but also are endangering the wildlife.

"With the ultimate weapons against nature now possessed by man," Secretary Udall claims, "only a conscious and directed effort to contain them will guarantee man's future."

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ICHTHYOLOGY

'Push' From Behind Moves Fish Forward

► THE PILOT FISH may not be such a "pilot" after all, but may move along because that big fellow, the shark, is right behind him.

Fish in a school may move forward because of stimuli from behind them—not because they are leading or following a fish in front.

This new theory about the movements of fish has been set forth by Dr. Evelyn Shaw, department of animal behavior at the American Museum of Natural History, New York.

After working with hundreds of young atherina fish, similar to the silversides, Dr. Shaw concludes that each fish in a school moves forward in response to a neighboring fish moving past its eye vision.

As one fish from behind moves, this movement stimulates the fish ahead which moves and triggers the next fish, and so on. In this way the whole school moves forward. As for the last fish, she said, it seems to straggle and lag behind.

Fish can see a wide area on both sides of the body, Dr. Shaw pointed out. The vision is almost semi-circular, sweeping from mouth to tail. Thus a movement from behind is easily noticed.

Dr. Shaw conducted her experiments on different fish of the schooling or social type, such as the common household pet, the tetras, and the zebra fish. She placed tanks of these fish inside a rotating drum which had stripes, usually yellow and black, painted on the inner walls. As the drum was turned, the stripes would move and the fish would be stimulated to move, tending to lead rather than follow the patterns.

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VITAL STATISTICS

Birthrate Decline Continues in U.S.

► AMERICAN WOMEN are not producing enough daughters to replace themselves, as the birthrate falls to its lowest since 1945.

The latest Natality Statistics Analysis of the Public Health Service takes a hopeful outlook, however, saying that trends indicate this situation is due for an upward swing. Parents in earlier age groups have produced more children earlier in their married life.

The birthrate in 1962, however, marked the fifth year in which the decline, based on the number of live birth per 1,000 population, continued since the last peak year of 1957. The 1962 birthrate was about four percent below that of the previous year.

There is less childlessness today but the trend is toward medium-sized families of two to four children. There is a drop in the larger-sized families of six children or more.

Alaska leads in the birthrate, followed by New Mexico and Utah. The lowest birthrates of all the states are in Oregon and Pennsylvania.

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