

## PSYCHOLOGY

**Accelerated Dreams May Prevent Behavior Change**

► PEOPLE who are permitted to dream for only a few seconds may unknowingly dream very rapidly to preserve their normal pattern of behavior.

Previously, preventing the dreaming process was found to bring certain changes in behavior such as "anxiety, irritability and difficulty in concentration."

However, a study of dream deprivation at the Neuropsychiatric Institute, University of California Medical Center at Los Angeles, did not find any psychological changes that could be attributed to dream curtailment.

The experiment detected the onset of a dream by measuring the number of rapid eye movements of the subject. When a rapid eye movement period began, the subject would be fully awakened within 15-40 seconds.

Drs. Anthony Kales, Frederick S. Hoedemaker, Allan Jacobson and Edward L. Lichtenstein, reporting in the British journal, *Nature*, 204:1338, 1964, try to explain why subjects who were awakened after this brief period often remembered short, vivid dreams and did not experience any behavioral changes observed in an earlier study.

The brief period of dreaming may be enough to prevent any behavior changes, the doctors report. At present they are investigating the possibility.

The study did confirm previous findings of a progressive increase in "attempts to dream" during a period of dream deprivation and of an increase in dream time during the recovery nights following a deprivation period.

• Science News Letter, 87:40 January 16, 1965

## ASTRONOMY

**Instruments Readied To Scan Sun in 1965**

► NUMEROUS new instruments are being readied by scientists to give the sun its most intense scanning yet during 1965.

Stratoscope II, the U.S. balloon-borne telescope that is carried high above most of earth's atmosphere to take clear pictures of the sun and planets, will have a European rival. It will be called "Spectrostratoscope," and is designed specifically to make highly detailed studies of features of the sun's surface.

Spectrostratoscope will be built for the Fraunhofer Institut, Breisgau, West Germany. A solar telescope that eliminates the problem of temperature control within a dome by eliminating the dome is also being built for this Institut. The domeless telescope will be installed at the Institut's Capri Observatory in Italy.

A three-color photographic technique that shows material moving toward and away from the sun's surface has now been perfected by scientists at Lockheed-California Company, Burbank, Calif.

A series of these three-color negatives, when shown as a motion picture, reveals turbulences of the solar surface in three dimensions.

A physicist from Brookhaven National Laboratory, Upton, N.Y., is building a "swimming pool" full of cleaning fluid 5,000 feet down in a silver mine in order to capture solar neutrinos. Neutrinos are uncharged nuclear particles having no observable mass.

Although neutrinos react with matter so infrequently that they can, on the average, penetrate 100 trillion miles of lead, the perchlorethylene tank should catch four to 11 interactions each day.

A new solar telescope at the Sacramento Peak Observatory of the U.S. Air Force Cambridge Research Laboratories in New Mexico will have a conical tower 136 feet high containing light-collecting mirrors, with the objective mirror of the instrument 180 feet below ground.

Now being used for observation at Kitt Peak National Observatory in Arizona is the McMath solar telescope, which has a focal length of 300 feet.

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## AERONAUTICS

**Squadron Tests Tri-Nation Jet Plane****See Front Cover**

► AN INTERNATIONAL squadron consisting of three crews each, from Great Britain, West Germany and the U.S., is currently evaluating the new vertical/short-take-off-and-landing jet (V/STOL), the Hawker-Siddeley P1127, seen on this week's front cover.

When the full group goes into operation in the spring, the wings of the nine planes in the squadron will carry the triple insignia of the three countries. The planes have made more than 2,000 take offs and landings, both from ground runways and from an aircraft carrier.

At least 16 jet pilots have qualified in the planes, including the pilots from the tripartite squadron.

The P1127 has a ceiling of more than 40,000 feet. It needs no ground run except when overloaded.

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## AGRICULTURE

**New Airplane Wing Helps to Spray Crops**

► IMPROVED CROP DUSTING will be possible because of the development of a new airplane wing.

The wing has a slot on the upper trailing edge through which fertilizer, seed or pesticide can be sprayed. A controlled blast of air, produced by a separate engine, ejects as much as 50 pounds of material per second while the plane travels at up to 140 miles per hour.

N. B. Akesson and W. E. Yates of the department of agricultural engineering at the University of California, Davis, and Kenneth Razak, dean of the college of engineering at the University of Wichita, Kansas, and president of Aerial Distributors, Inc. of Wichita, collaborated on the airplane design.

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## TECHNOLOGY

**Physicians Send Facts 6,000 Miles to Computer**

► PHYSICIANS attending a meeting in Copenhagen, Denmark, communicated messages directly with a computer at Santa Monica, Calif.

The 6,000 mile distance is believed to be the longest span over which information has been fed into a computer.

Physicians until now had to describe most of their technical data to computer programmers who would break these descriptions down into computer terms. Sometimes it would take hours or days for results.

The computer program of the System Development Corporation has operated at Santa Monica eight hours a day since January. It is now being expanded to handle a maximum of 30 or more programs at the same time.

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## FOOD TECHNOLOGY

**No Oil Needed in New Food-Cooking Process**

► FOOD can be cooked quickly, without the use of hot cooking oils, using a new application of a not-so-new process.

Rapid heat transfer five to ten times as great as in oven or air-stream cooking can be achieved by this technique, known as the fluidizing-bed process.

The process was introduced in the United States more than 20 years ago by the petroleum industry. Since then it has found many and varied applications such as freezing (in addition to cooking) foods, coating engineering materials, removing fumes and dust in certain industrial processes and disposing of paper mill wastes.

In the fluidizing-bed technique the material to be processed is suspended in a container by blowing a gas or liquid through the material. The gas blows up through a grid which scatters it and causes it to "bubble" uniformly through the material being processed. The gas bubbles create a rapid mixing of solids, giving the appearance of a boiling liquid.

Dr. William M. Goldberger and Herman Nack, chemical engineers at Battelle Memorial Institute's Columbus Laboratories, Columbus, Ohio, recently reported on the new uses of the fluidizing-bed process.

Cooking by this process is "somewhat like french frying without the use of oil," they said. Foods that have been cooked in this manner include fish, nuts, meats and vegetables.

Fluidized-bed freezing is carried out in much the same manner as cooking except that cold air, 15 to 30 Fahrenheit degrees below zero, blows up through perforated trays or conveyors and fluidizes the food particles.

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# CE FIELDS

## CONSERVATION

### Pesticides Washed Into Seas Around Britain

► THE SEAS around Britain and the north-west European countries are substantially contaminated by "organo-chlorine" pesticides washed from farm land and carried down by rivers.

"It is clear that agricultural pesticides are contaminating the environment to a far greater extent than has hitherto been suspected," stated a recent report of the British Government's Nature Conservancy for 1964.

Eggs of 52 species of sea-birds were collected from four sites hundreds of miles apart. Upon examination, all eggs were found to contain residues of poisons. This shows "an astonishing and widespread contamination of the sea and its fauna," the report said.

The eggs were taken from species that feed on fish, marine mollusks or plankton: oyster-catchers, shelduck, kittiwake, little tern, sandwich tern, puffin, razor-bill, guillemot, shag and cormorant.

The eggs disclosed contamination varying from 0.2 to 8.9 parts per million. As yet, no one knows what pesticide residues a sea-bird may carry to produce eggs containing these levels of contamination, nor the physiological effects of such concentrations.

Work is being conducted by the Nature Conservancy to investigate contamination by poisonous insecticides.

Bengalese finches are being bred to study the sub-lethal effects of residues on reproduction and behavior, and wild house sparrows are being caught and used for toxicological tests.

Tests have also been started to establish the uptake of insecticides by earthworms, slugs, snails, millipedes, butterflies and moths.

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## DENTISTRY

### Criminal Is Cured By Artificial Teeth

► A MAN who said he turned to drink and crime because a war injury caused him to grind his teeth loudly at night has been released from prison as cured. He had his teeth taken out.

The Home Secretary has remitted the remainder of a three-year sentence imposed on Peter McCann, aged about 45, in November 1962 for "club breaking with intent." The decision follows a four-month fight by Lord Stonham, president of the Prison Reform Council.

Mr. McCann, who now has false teeth that are removed at night, pleaded at his trial and in an appeal that he had taken to drink and crime because of the affliction he blamed on a war injury in 1941. He served in the Royal Navy for 12 years.

Because of his teeth grinding, Mr. McCann had been unable to keep any lodgings. Eventually he was forced to sleep outside and this made it difficult for him to keep a job.

"It is extraordinary but it almost wrecked the man's life," Lord Stonham said.

At Camp Hill Prison, Mr. McCann was also very unpopular with other prisoners who were kept awake by his nocturnal habit.

Finally the Minister of State at the Home Office wrote to Lord Stonham, saying medical evidence available at first did not support his case.

"More recently, the prison medical officer arranged for Mr. McCann to have his teeth extracted and for him to be supplied with false teeth which he removes at night. He reports that this has had a very good effect on the prisoner, who now feels fit to lead a normal life. There is thought to be a good prospect that he will now settle down.

While praising the Home Secretary's "humane decision," Lord Stonham said the medical evidence upon which he has been released is exactly the same as he put forward when he was sentenced.

"The only difference is that he has come before an understanding and sympathetic doctor."

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## AERONAUTICS

### Computer-Planned Flights Cut Costs

► JET AIRLINERS, crossing the Atlantic between the United States and Europe, are reaching their destinations minutes faster and hundreds of dollars cheaper due to a new flight mapping computer.

The computer is capable of digesting a steady stream of weather information and continuously changing flight plans right up to take-off and even during the flight. The computer at Manhasset, N.Y., operated by Aero Performance, Inc., blends last minute data with a host of other factors and comes up almost instantly with the best possible route.

The average time savings on Europe-bound flights is about five minutes, which brings a fuel savings of 1,000 pounds or \$50. There is also an estimated \$50 to \$100 savings in operating costs. More important, however, the aircraft's payload potential is greatly increased with every minute saved being worth \$100 to \$200.

Permanently stored in the computer are fixed data of individual airlines' specifications in areas such as operating capacity, weight, climb time, fuel and distance. In addition, every six hours variable data such as wind direction, wind speed and temperature are fed into the computer.

The computer, built by Aero Performance, Inc., spews out its recommendations in the form of IBM cards at the rate of 125 cards a minute. The cards are then set in an IBM telegraphic card reader which converts the data on the cards into telegraphic code for up to the minute teletype messages to the airlines.

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## ARCHAEOLOGY

### British Explore Sea For Ancient Treasure

► A GROUP OF EXPERTS are meeting in London to organize underwater archaeology in Britain. It is inspired by the spectacular development of this branch of archaeology in the Mediterranean and by the discoveries of a band of amateur divers who have been exploring the bed of the River Thames for three years.

The new group is the British Nautical Archaeological Research Committee. Lt. Cmdr. G. P. S. Naish, National Maritime Museum, Greenwich, is chairman and Peter Marsden of the City of London's Guildhall Museum is secretary.

On the committee are representatives of the British Museum, Science Museum, Tower Armouries, Institute of Archaeology, Council for British Archaeology, and the British Sub-Aqua Club, which is the spearhead of the new movement.

Its field is enormous. It plans to organize a systematic program of exploring and recording wrecks of historical interest, ancient harbors and harbor installations.

It will also investigate prehistoric sites and causeways which have been lost by changes in the sea level. Another important field of inquiry will be into the methods of ship construction in olden times, as revealed by wrecks.

The scientific and technical group of the Sub-Aqua Club estimates that its amateur divers have a full 20-years' work ahead of them in the River Thames alone.

R. F. Forrest Webb, secretary of the club, says winter time is the best for exploration, since there is less disturbance from river traffic. Their findings in the past 3 years have included a prehistoric living-floor, a neolithic mace-head of unusual type, a fine Bronze Age brooch, arrowheads and masses of pottery and medieval material.

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## BIOTECHNOLOGY

### Machine Used to Test Artificial Heart Valves

► A MACHINE that pumps like a real heart and a chemical mixture that stimulates real blood are testing artificial valves for defective human hearts.

Researchers at the University of Texas here have developed a machine called a human pulse duplicating system which is capable of stimulating a wide variety of conditions to which the human heart is subjected. The machine pumps a mixture of water and glycerine that acts like real blood and does not break down or clot.

The heart machine can pump half a gallon of fluid a minute to simulate the heart at rest or it can suddenly shoot up to seven and a half gallons a minute, the rate of an athlete's heart during strenuous exercise.

Although present artificial heart valves work well under ordinary conditions, improved long-lasting versions are now under study.

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