

BIOLOGY

Light Variations Affect Rabbit Reproduction

SEASONAL VARIATIONS in light apparently cause rabbits to reach their peak of reproductivity in spring.

This concept, suspected by scientists for some time, has been bolstered by additional evidence from the laboratory of Dr. Charles H. Sawyer of the University of California Medical School, Los Angeles.

Some scientists had thought that temperature conditions induced the female rabbit to release its eggs, as a part of the mating sequence, most readily in late winter and spring. Dr. Sawyer's studies show, however, that this tendency is the same in California's year-around mild climate as in areas where there are seasonal climatic extremes.

He was able to induce spontaneous ovulation in the rabbit by injection of the female sex hormone, estrogen, in winter and spring but not in summer or autumn.

This suggests that the nervous system, which controls release of certain hormones from the pituitary gland, responds in some way to length of day to bring about hormone levels necessary for ovulation.

Apparently this is one way of insuring that the young are born during a period encouraging to maximum survival.

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METEOROLOGY

Tiros I Photographs Tornado-Producing Cloud**See Front Cover**

A TORNADO-PRODUCING CLOUD had its picture taken by TIROS I, the United States meteorological satellite orbiting 400 miles above earth.

The possibility of a tornado-cloud picture is highly remote. The rare photograph, shown on the cover of this week's SCIENCE NEWS LETTER, was made on May 19, and was discovered by the Weather Bureau after a "painstaking analysis of the more than 20,000 photographs taken by TIROS in its operational lifetime."

The picture is a significant step forward in our efforts to understand and predict weather.

The rare exposure showed a bright square cloud in an otherwise cloudless part of the sky. The fact that this image was taken over the Southern Plains, where an area of heavy thunderstorm activity had been reported, prompted the Weather Bureau to determine whether the square cloud mass might represent the beginning of a severe weather system. The tornado is one of the smallest and most dangerous of all storms.

Comparison with other weather observation at the same time by meteorologists revealed that the "square" cloud was in a heavy thunderstorm area reported in Hobart, Okla., Childress and Wichita Falls, Texas.

The weather detectives also found strong evidence indicating that the tornado cloud

mass later expanded and spread northeastward, leaving a trail of tornadoes and hail in central Oklahoma.

The discovery is considered a stroke of luck. David S. Johnson, head of the Weather Bureau's satellite section, cautioned that not every isolated cloud mass seen from a satellite will be a warning of severe weather. But the TIROS tornado shot indicates that in the future detection of unusual cloud masses will improve the meteorologist's ability to recognize and pinpoint impending small-scale severe weather situations.

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GENERAL SCIENCE

New National Science Foundation Program

AN EXPERIMENTAL PROGRAM of general grants designed to strengthen the scientific capability of the nation's colleges and universities has been announced by Dr. Alan T. Waterman, director of the National Science Foundation.

The grants will be given to the educational institutions without restriction for use and will complement Foundation support for specific science and science education projects.

"Federal support of research for particular projects, by earmarking funds for those projects, tends to handicap the institution in developing its over-all scientific capability," Dr. Waterman said.

The new program of institutional grants will enable the college or university to get necessary equipment, employ a needed instructor, technical assistant or specialist, acquire the data that "may make a great difference in the prompt solution of some difficult situation," Dr. Waterman explained.

Amount of grants to an institution will not exceed \$50,000 for any one fiscal year. Generally they will be limited to five percent of the Foundation's research grant made to the institution in the previous year.

Although the institutions will be free to allocate the funds without restrictions, they will be required to report to the Foundation annually on how the funds have been expended and the purpose underlying the investment.

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METEOROLOGY

Cloud-Seeding Program Seeks Rain-Making Proof

ALTHOUGH THERE IS no conclusive evidence as yet, University of Arizona physicists are attempting to discover whether or not cloud-seeding has affected Arizona rainfall. The annual summer cloud-seeding program, started in 1957 in cooperation with the University of Chicago, is aimed at furnishing scientific proof that rain making is or is not possible through cloud-seeding. Two more summers of studying cloud-seeding results are expected to yield a definite answer about rain making.

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IN SCIENCE

TECHNOLOGY

Nuclear Altimeter Being Built in Massachusetts

A NUCLEAR ALTIMETER is now being developed for the U. S. Army Ordnance Corps by Tracerlab at Waltham, Mass. It will differ from a conventional altimeter in that it will use nuclear "beta back-scatter" techniques for altitude sensing. These techniques are now used to measure the thickness of material and for process control in industry.

In its airborne role, "beta back-scatter" will be used to sense atmospheric density at varying heights above the earth's surface. Because atmospheric density is related to height, the instrument will be able to give direct, accurate indications of altitude.

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VETERINARY MEDICINE

Parakeet Revived by Artificial Respiration

ARTIFICIAL RESPIRATION has proved its value once again—it even works on parakeets.

Dr. Sidney J. Michael, small-animal veterinarian of Erie, Pa., reports that a 10-year-old green parakeet was brought to his office for removal of a tumor on the right wing tip. In all other respects the bird appeared to be perfectly healthy.

The doctor gave a local anesthetic and removed a few feathers in the area to be operated. He had just turned to pick up some instruments when his assistant told him the bird was dead.

Dr. Michael reports:

"I took the bird in my hand and, to all appearances, it was completely lifeless. I lifted the bird to my ear and listened and I could hear its heart beat; the pulse was relatively full and normal.

"Without much hope of reviving the bird, I performed manual artificial respiration with my index finger and thumb. Each exertion of pressure, at the rate of about twice a second, caused the bird to emit a more or less natural squeak."

The doctor then rigged up a parakeet-sized oxygen tent, and after about five to ten minutes of this combined treatment, "I felt one foot take hold of my finger." In a few minutes the parakeet patient blinked an eye, kicked his feet, wiggled his toes and shook his head. With a little more oxygen he regained consciousness, but was still a bit wobbly. In view of the bird's narrow escape, the doctor decided that it would be best to give no further treatment.

The next morning, Dr. Michael reports in the Journal of the American Veterinary Medical Association, 137:105, 1960, the bird was as chipper as if nothing had ever happened.

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CE FIELDS

MEDICINE

Microscopic Liver Cells "Pan" for Gold in Blood

MICROSCOPIC CELLS in the liver, which "pan" for gold in the blood stream, are helping science to find out more about health and disease in the human body.

These microscopic gold miners collect a special "gold dust" deliberately injected into the body. The gold is in a very finely divided or colloidal state and is radioactively tagged.

The cells (named von Kupffer after their discoverer) are amoeba-like cells located mainly in the liver and have the function of clearing debris from the blood stream. Thus they collect the radiogold as it comes through the liver.

Drs. George V. Taplin, Jane Hayashi, Delores Johnson and Earl Dove of the University of California Medical School, Los Angeles, are utilizing this property of the cells to study medical problems related to liver blood flow.

By tracing the radiogold as it leaves the blood and is taken up by the liver's von Kupffer cells, the investigators are able to gauge liver blood flow.

The gold test is most useful in detecting impairment of liver blood supply, which occurs mainly in cirrhosis.

The gold procedure is used with another tracer test employing a radioactive dye, Rose Bengal, to diagnose liver disease. The Rose Bengal test measures the function of the liver's "chemical factory" (polygonal cells) provided one knows the blood supply of these cells is adequate. It also indicates bile duct obstruction (obstructive jaundice).

The two tests in combination help the physician to make a rapid and accurate diagnosis of the particular liver disorder and can even detect when two disorders occur simultaneously.

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BIOCHEMISTRY

Protein Coat Protects DNA From Radiation

THE REASON the nucleus of a body cell is more subject to radiation damage at certain times during cell division than at others may have been found by a team of British chemists.

The heredity-carrying chemical, deoxy-ribonucleic acid (DNA), is found in the cell's nucleus and is wrapped in a protein sheath. This protective jacket, the chemists found, acts as a cushion by absorbing a great deal of radiation, thus preventing penetration to the DNA.

However, during certain phases of cell division, the DNA sheds its protein coat and the radiation can go through unimpeded. It is at this time the radiation does the damage, which may be to cause a

mutation or break up the DNA molecule.

For some time it has been known that DNA surrounded by water is rather easily destroyed by radiation. This is because the radiation causes a chemical reaction that forms radicals, which eventually rupture the hydrogen bonds in the DNA molecule.

In a more normal situation, where DNA is not directly in contact with water, it takes much more radiation to cause damage. In experiments with nucleoproteins from calf thymus glands, the chemists found that with doses up to as high as 100,000 rads, almost all the damaging radicals reacted with the protein and the DNA remained substantially undamaged.

In man, certain death results in two to eight weeks from a radiation dose of about 800 to 1,000 rads.

The research is reported in *Nature*, 187:319, 1960, by Drs. P. Emmerson, G. Scholes, D. H. Thomson, J. F. Ward and J. Weiss, all of King's College, University of Durham, at Newcastle upon Tyne.

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PSYCHOLOGY

New Booklet Advises On Mental Problems

DO'S AND DON'TS for giving assistance to troubled persons are offered in a new free booklet, "How to Deal With Mental Problems," issued jointly by the National Association for Mental Health and The Advertising Council.

Written by Harry Milt, the psychologist who is the association's director of public information, the booklet replaces "How to Deal With Your Tensions," by the same writer. More than 1,500,000 copies of the latter booklet have been distributed in the past three years.

Mr. Milt suggests a number of ways to be helpful to a person with emotional problems. These are the Do's:

1. Do let the person know you're interested and care.
2. Do be a good listener.
3. Do try to help out with some practical problems.
4. Do send for and read other literature.
5. Do get help from an expert, if necessary.

These are the Don'ts:

1. Don't set yourself up as a judge.
2. Don't tell him to calm down or "snap out of it."
3. Don't argue him down.
4. Don't, by any means, try to be an amateur psychiatrist.

It is estimated that about 17,000,000 persons in the United States (one out of ten, approximately) require professional attention for mental or emotional disorders that are serious.

Signs of emotional trouble include selfishness and greediness, helplessness and dependency, poor emotional control, day dreaming and fantasy and hypochondria. Persons who continuously have a chip on the shoulder, those who are excessively moody, anxious or suspicious, are very likely to be suffering from a mental illness.

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TECHNOLOGY

Convert Landing Vehicle To Gas Turbine Power

CONVERSION of a military amphibious landing craft to gas turbine power now underway will boost the craft's payload 5,000 pounds and its speed 30%, according to the General Electric Company. The total weight of the turbine engine-transmission package is under 3,200 pounds compared to the more than 6,500 pounds of equipment replaced. Space occupied by the turbine engine itself is only nine cubic feet, compared to 65 cubic feet for the reciprocating power plant.

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SOCIOLOGY

Boredom May Be Cause Of School Vandalism

A RASH OF VANDALISM may appear in your local public high school when:

1. Teachers and students alike are bored and have a couldn't-care-less attitude and the students' idea of school loyalty means only going to the school football games.

2. Students, teachers and parents do not get along with one another.

3. There are rapid or extensive changes in the school program, student body or the staff.

4. School administration and leadership are inadequate and both students and teachers are dissatisfied with them.

5. There is community instability and neighborhood deterioration.

These "signposts to vandalism" are based on answers to 1,170 student questionnaires, 387 teacher interviews and histories of 16 Syracuse public junior and senior high schools. The study was conducted by Dr. Nathan Goldman, Syracuse University professor of sociology, under contract with the U. S. Office of Education.

"The one condition most closely related to high property damage," Dr. Goldman found, "is alienation from or lack of identification with the school."

Good relationships among students, teachers and parents were found more often in low damage than in high damage schools. A strong democratic administration was also more characteristic of low damage schools.

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MEDICINE

AMA Says Hypnosis Is Not Good Sportsmanship

THE USE OF HYPNOSIS in athletics is dangerous and unsportsmanlike, two committees of the American Medical Association charged.

The use of hypnosis in athletics may aggravate physical impairments of which the athlete is unaware, according to the AMA Committee on Hypnosis and the Committee on the Medical Aspects of Sports.

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