

## ASTRONOMY

**Moon "Volcano" May Be Puff of Dust and Gas**

► THE "VOLCANO" on the moon reportedly observed by the Russian astronomer Nikolai A. Kozyrev was probably a puff of dust and gas erupting, due to heating of the dust by natural radioactivity.

If this is true, "a large and fairly accessible source of power" should be available to future moon settlers, Dr. J. H. Fremlin of the physics department, University of Birmingham, England, reports. He suggests that, whatever the origin of lunar craters, they are now filled with dust to a considerable depth.

This dust will be heated by the moon's natural radioactivity, even if this is equivalent only to two parts per million of uranium, which is much less than the total activity of the earth's crust. An isolated piece of dusty material, Dr. Fremlin calculated, would show a temperature rise of about 46 degrees Fahrenheit every million years.

Under equilibrium conditions, which the moon has now reached, all of this heat must reach the surface. Thus at a depth of a little more than a yard, the temperature would reach about 465 degrees Fahrenheit. Therefore, Dr. Fremlin believes the dust could not lie indefinitely over large areas to depths of more than about 27 yards because the heat at that depth is severe enough to soften basalt.

With a dust thickness of only a few yards, heat would be conducted to the sides of the crater as well as through the dust. Even if the craters were not formed by volcanic action, Dr. Fremlin suggests the mere filling of larger ones with dust would, in time, result in volcanic activity in the centers.

It is unlikely that major quantities of liquid or solid would be ejected during any one eruption, he reports in *Nature* (Jan. 24). The very low mechanical pressure of the dust would, however, cause periodic release of puffs of hot gas and dust. Dr. Fremlin likened these puffs to the slow liberation of marsh gas leading occasionally to bursts of mud and gas from the bottom of a stagnant pond.

He calculates the lunar puffs occur "many times" each million years.

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## ANTHROPOLOGY

**"Pin Money" Economy Used by African Tribes**

► THE AZANDE people of Africa have a unique "pin money" economy.

They use money to meet social obligations and not to buy food and other products of subsistence. In addition, they have become savers, burying their money in the form of silver coins, reports Dr. Conrad C. Reining of the University of Minnesota.

Dr. Reining based his report on a visit to the Azande, an amalgam of tribes living in the Belgian Congo, French Equatorial Africa and Sudan.

Money was introduced to their society

about 50 years ago and they have developed their own set of roles for it.

In pre-European days, each family was largely a self-sufficient economic unit, producing the agricultural necessities of life for itself. The wealthiest chiefs merely possessed a great deal more of the perishable products than did their subjects. And there was a tradition of destroying property of an individual when he died.

Today, the Azande family units still produce most of their own subsistence goods. Even among families of which members earn money by working for the Government or selling part of the crops, the spending of money for food is regarded as wasted. And now, when a member dies, his money is kept in the family.

The natives generally save their money for the following obligations: to pay taxes; as marriage payments; as the preferred form of gift to friends and relatives; as contributions to feasts so that the sponsors can make purchases to provide for the feasts, and to pay fines such as that levied by a father-in-law for failure to perform duties of a son-in-law.

Money also is used to purchase imports, such as bicycles, that are not produced at home. Dr. Reining reports in the *American Anthropologist* (Feb.)

Science News Letter, February 7, 1959

## ENGINEERING

**Suggest Peaceful A-Uses Require More Tests**

► DEVELOPING peaceful uses for nuclear explosions, such as mining shale for oil in the Colorado Plateau, will require further nuclear tests, even if the United States and Russia agree on a weapons test ban.

Atomic Energy Commission chairman John A. McCone said such further tests might be supervised by an international commission set up under the hoped-for agreement. He said peaceful uses would be discussed during the current Geneva talks, and expressed hope that the status of non-weapons tests would be spelled out soon.

Mr. McCone confirmed that the Nevada and Pacific test sites were being maintained in a state of readiness that would permit their use within a short time. Peaceful uses of nuclear explosions, he said, were a separate issue from weapons tests.

The Government's official position is to support a permanent suspension of weapons tests, provided there are adequate safeguards to allow detection and identification of outlawed explosions with the highest attainable degree of certainty.

One problem is the difficulty of distinguishing between nuclear tests and earthquakes. The 1958 series of three shots showed the 1957 single explosion was unusual, Dr. Willard F. Libby, AEC commissioner, said. The recent tests proved that the detection system proposed on the basis of the 1957 unusual explosion was inadequate.

Mr. McCone said the lowest limit of detectability may be as high as 20 kilotons, equivalent to 20,000 tons of TNT.

Science News Letter, February 7, 1959

**IN SCIENCE**

## PHYSIOLOGY

**Temperature Affects Reproduction in Rats**

► COLD HAS a stimulating effect on reproductive performance in rats, two Egyptian scientists report.

Their research helps explain why some "autumn breeders" such as goats and sheep breed at a time when there is increasingly less light. Light had been considered the main gonad or sex gland stimulating factor.

Now it appears that more light and lower temperatures both stimulate reproductive ability.

Working with 48 mature male rats, the scientists exposed them to various light intensities at two temperatures, about 65 degrees Fahrenheit or about 95 degrees Fahrenheit. At each temperature, three groups of rats were exposed to continuous light, continuous darkness, or 12 hours of light alternating with 12 of darkness.

Rats at the low temperature had heavier testes while the other groups showed partial atrophy of the tubules. However, at high temperature there was a significantly greater amount of sex-gland-stimulating hormone, which was ineffective. This is probably due to decreased use of the hormone by the "bad" testes, the scientists conclude.

Exposure to light resulted in heavier seminal vesicles. Also there was an increased production of gonadotrophic hormone, especially of the luteinizing hormone.

F. A. Soliman, Faculty of Veterinary Medicine, Giza, Egypt, and A. S. Abd-El-Malek, Veterinary Research Institute, Doki, Egypt, reported in *Nature* (Jan. 24).

Science News Letter, February 7, 1959

## VETERINARY MEDICINE

**Find Sedative for Pets Undergoing Surgery**

► A NEW SEDATIVE for dogs and cats about to undergo surgical operations has been reported.

The drug is called trimeglamide. It induces sleep in dogs and cats without causing them to exhibit odd behavior when they awaken, three California scientists report in *Science* (Dec. 19, 1958).

In fact, the pets look and appear to be enjoying a normal "cat nap," Georg Cronheim, James T. Gourzis and I. M. Toekes of Riker Laboratories, Northridge, Calif., say. Mr. Gourzis is now at the University of Manitoba, Winnipeg.

The animals tested did not thrash around when the drug was administered, nor did they lose their muscle coordination. There is no other drug for this purpose that animals respond to so well, the scientists say.

Science News Letter, February 7, 1959

# E FIELDS

## PHYSIOLOGY

### Normal Offspring From Nicotine-Dosed Rats

➤ NICOTINE may not be the monster-maker it has appeared to be.

Rats given daily doses of nicotine for the first 20 days or on the 9th through 12th days of pregnancy have failed to produce any abnormal offspring, Dr. Lester M. Geller of Columbia University's College of Physicians and Surgeons says. There was also no harmful effect on litter size or the baby rats' weight, nor did the nicotine increase the number of offspring dead at birth.

"These results differ sharply from the effects in mice reported by others," the scientist explains.

Recent research indicated nicotine produced misformed bones in offspring as well as increasing the number of deaths and incompleting pregnancies in the dosed mice. There are several reasons why these results may not be typical effects of nicotine, Dr. Geller says.

Doses used in some Japanese research were about six to 17 times the dose the American scientist used. As much nicotine as this would produce convulsions severe enough to be fatal in the animals he experimented with, Dr. Geller explains.

Possibly, he said, there is also a species difference, between rats and mice, in the maternal animal's tolerance for nicotine.

While the Japanese researchers believe nicotine had a direct action on the embryonic mice cells, thus producing malformations, the defects may have been due to lack of oxygen.

Anoxia in the pregnant mouse has been shown to produce the same kind of abnormalities in offspring. Since nicotine is known to cause anoxia, Dr. Geller points out, the results reported by the Japanese may have been due to anoxia. Also large quantities of any of a "wide variety of agents" given to a pregnant animal will frequently result in defective or dead offspring, he says.

Details of his research appear in *Science* (Jan. 23).

Science News Letter, February 7, 1959

## MEDICINE

### Cholesterol Plays Some Role in Cancer Growths

➤ CHOLESTROL, long suspected as a cause of heart disease, is now believed to be involved in cancer growth.

Animal studies have shown that the body produces increasing amounts of the fat-like substance as a cancer thrives. Investigators believe that the tumors trap the cholesterol and convert it for some yet unknown use.

A research team under the direction of Dr. Gregory Pincus and co-researchers at the Worcester Foundation for Experimental Biology, Shrewsbury, Mass., are investigating the methods by which the body manufactures cholesterol and its role in various diseases.

Cholesterol is produced by many tissues but particularly by the liver. The body uses it to manufacture sex hormones and adrenal hormones that cope with the effects of stress.

Cancer-causing chemicals affect the animals' livers, resulting in less than normal outputs of cholesterol. But as soon as the tumor starts growing, or if a large tumor is transplanted to the animal, cholesterol output rises to about twice the normal amount, Dr. Pincus said.

Dead and decaying tumors are loaded with cholesterol, but the scientists do not know whether the tumor manufactures or snatches this material from the blood.

Some scientists report that the cholesterol level of the blood of cancer patients is high; others report finding low levels. Since the reports do not reveal the stages of cancerous growth in each patient, it is yet to be determined whether cancer patients, like animals, might have low cholesterol levels early in the disease and high levels later.

Co-workers assisting Dr. Pincus are Drs. Erwin Schwenk, Dean F. Stevens, George J. Alexander, Allen M. Gold, G. M. C. Masson, S. B. Koritz and F. G. Peron.

Science News Letter, February 7, 1959

## SURGERY

### Better Operation Found For Palsy Foot Deformity

➤ ONE OF the more common foot deformities found among victims of cerebral palsy can now be treated by a more effective operation, two Rhode Island physicians reported.

The deformity is called spastic equinus. The afflicted must walk on their toes. They are unable to touch the ground with their heels. For decades, the standard operation for the condition has been to cut the Achilles tendon. Thus the calf muscle of the leg will no longer pull up the heel.

But results of this operation have been disappointing, Drs. Carroll M. Silver and Stanley D. Simon of Providence, told doctors attending the American Academy of Orthopaedic Surgeons meeting in Chicago.

The Rhode Island surgeons reported 110 cases of spastic equinus that have received a "new" operation that brought effective and reliable results. Only five failures have occurred among these.

The operation consists of lowering the two-jointed gastrocnemius, the large muscle in the back of the leg, to below the level of the knee joint, converting it into a one-joint muscle. This procedure eliminates the deforming factor.

The surgeons urged that the operation be performed on children before they pass the age of three years. The average youngster was admitted to the hospital the day prior to the operation and was discharged three days after its performance.

Science News Letter, February 7, 1959

## ASTRONAUTICS

### Russia Shows Confidence In Own Space Conquest

➤ THE RUSSIANS are matching their commendable space accomplishments with a bold, dedicated confidence that the ultimate conquest of space will be theirs.

There seems to be little question in the Soviet mind that the Communist Party's directive to realize manned interplanetary travel will be fulfilled in and by the Soviet Union.

These facts are evident to one who has read Russia's well-established literature on rocketry and space travel, the House Select Committee on Astronautics and Space Exploration reports in the *Space Handbook*.

The scope of the Russian confidence is reflected in the instruction now given to Russian satellite observers. Whereas authorities originally instructed these observers to send their tracking data to Moskva-Sputnik, they now ask that data be sent to Moskva-Kosmos.

In addition to their well-publicized advances in rocketry and artificial earth satellites, the Soviets are building up a huge backlog of detailed information from concentrated studies in geophysics, astrophysics, celestial mechanics, radio astronomy, astrobiology and space medicine. They hope, no doubt, that an intimate knowledge of these fields will help make interplanetary communication a reality.

The recently published *Space Handbook* contains a full chapter on astronautics in the U.S.S.R., as well as a complete survey of astronautics and its applications. It was submitted by George J. Feldman, the Committee's director and chief counsel, and is available for 60 cents at the U. S. Government Printing Office, Washington 25, D. C.

Science News Letter, February 7, 1959

## MEDICINE

### New Method Detects Cancer of Colon

➤ A NEW AND highly effective method of detecting cancer of the colon reveals tumor cells when all other methods fail.

The method consists of cleansing the colon with a salt solution enema. Tumor cells have been found in colon washings of patients who had negative X-ray readings and/or proctoscopic examinations, Drs. Howard F. Raskin, Walter L. Palmer and Joseph B. Kirsner of the department of medicine at the University of Chicago reported to the American Cancer Society meeting in New York.

Of 45 patients receiving the "flushing" enema, six had previously had negative diagnosis from X-rays, five were classified as inconclusive and the rest had carcinoma in evidence. These 45 had also had an internal intestinal examination by proctoscope which did not detect a cancerous growth.

Unfortunately, many tumors are in the upper reaches of the colon. The patient may or may not exhibit bloody stool. The enema technique can flush out cells from those areas.

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