

## ASTRONOMY

**Russians Release Photos Of Moon's Far Side****See Front Cover**

RUSSIAN scientists have released a photograph of the far side of the moon as taken from U.S.S.R. satellite Lunik III.

The photograph on the cover of this week's SCIENCE NEWS LETTER shows the far side of the moon.

Soviet astronomers identify the long solid lines as the moon's equator. The heavy broken line at the left separates the part of the moon visible from the earth from the portion that cannot be seen. Solid lines surround objects absolutely established; objects that need more clarity of form are enclosed in heavy dotted lines; fine-dotted lines are around objects now being classified.

The arabic numerals, as given by Soviet astronomers, are as follows: 1—Moscow Sea, a crater 187 miles in diameter; 2—Astronauts' Bay of Moscow Sea; 3—Continuation of South Sea on the Moon's Face; 4—Crater of the main Tsiolkovsky Hill; 5—Crater of central Lomonosov Hill; 6—Joliot-Curie Crater; 7—Soviet Mountains; and 8—Sea of Dreams.

The Roman numerals designate areas visible from the earth: I—Humbolt's Sea; II—Sea of Crises; III—Marginal Sea; IV—Sea of Waves; V—Smyth's Sea; VI—Sea of Fertility; and VII—Soutl.ern Sea.

The apparent lack of craters and seas across much of the far side of the moon seems to corroborate a theory that predicted this side would be largely smooth. Some scientists believe at least some of the topography of the moon has resulted from the tug of the earth's gravity; thus the stresses and strains of this pull would be responsible for some of the surface.

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## ARCHAEOLOGY

**Ancient Crime Unearthed By Archaeologists**

A CLEVER crime has gone undetected from the time it was committed in the Middle Ages until it was disclosed this summer by Harvard and Cornell archaeologists digging on the site of the ancient Lydian city of King Croesus (famous for his wealth) in Sardis, western Turkey.

In the ruins of a Roman gymnasium, the archaeologists dug up a very heavy jar with the top tightly sealed with a lead lid. But when the lid was removed, the jar no longer contained the jewels or other valuables that apparently had once been buried in it. Instead, nothing but earth and stones were found. When it was buried, the scientists believe, a thief immediately removed the treasure, substituting earth and stones to delay detection of his crime.

The scientists did find wealth in Sardis, however. It consisted mainly of many ancient coins, glassware of great refinement and delicacy, decorated pottery, terracotta figurines and sculptures.

More than 3,000 years of history were spanned by the objects found, from the

second millennium before Christ, represented by crude cooking pots, to the 15th century after Christ when the city was destroyed.

One of the interesting finds at Sardis was an ancient shopping center, containing shops and restaurants. An unusual feature of the shopping center was a luxurious public toilet with marble seats.

The Sardis expedition was under the direction of Prof. George M. A. Hanfmann of Harvard. Associate director was Dean A. Henry Detweiler of Cornell.

A last-minute discovery made when the scientists were ready to stop digging for the season was of an Imperial inscription which appeared among the tumbled fragments of a large triple gate. The inscription mentions an emperor whose name is not preserved and an "Empress Julia." The scientists believe the gate was dedicated to the Empress Julia Domna, daughter of the high priest of the Sun God and wife of the Emperor Septimius Severus. This Empress Julia was renowned for her beauty and her intellectual interests but she finally ended her career by starving herself to death in 217 A.D.

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## MEDICINE

**Study Shows Cancer Drug Too Toxic for Human Use**

THE ANTI-TUMOR drug, 5-fluorouracil, that seemed to have promise a year ago, now appears to be too toxic for human use.

Attempts to pinpoint just how much of the drug might give a good anti-tumor response with reasonable safety were disappointing, the researchers say in *Cancer Research* (Oct.). Even giving the patient the largest dose he could tolerate of 5-fluorouracil, or FU, resulted in limited anti-tumor activity, they explain.

Of the 128 patients in the study group, eight showed "objective evidence of tumor regression" most of which was temporary. Only one of these patients showed severe toxic symptoms.

Dose rates were four, six or eight milligrams per kilogram body weight per day for a period of from 14 to 42 days. Toxicity symptoms included reduced white blood cell count, nausea, vomiting, diarrhea, oral ulcerations and loss of hair. Toxicity seemed to be less when the drug was given orally instead of intravenously, the researchers say.

"It seems unlikely that FU will contribute significantly to the therapy of cancer patients," they conclude.

The researchers include Drs. G. Lennard Gold and Clyde O. Brindley, National Cancer Institute, Bethesda, Md.; Thomas C. Hall and Marguerida M. Dederick, Harvard Medical School; Bruce I. Shnyder, Georgetown University School of Medicine, Washington, D. C.; Oleg Selawry and James F. Holland, Roswell Park Memorial Institute, Buffalo, N. Y.; Jacob Colsky and Ralph Jones, Jackson Memorial Hospital, Miami, Fla.; and Albert H. Owens, Jr., Johns Hopkins University School of Medicine.

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**IN SCIENCE**

## ASTRONOMY

**Russian Astronomers Study Moon Extensively**

BESIDES the recent photographs of the unseen side of the moon made from a Soviet rocket, Russian astronomers are engaged in a whole series of scientific studies of the moon.

Prof. A. A. Mikhaylov, director of the Pulkovo Observatory, has reported that the newest methods are being used in making measurements of the moon's temperature as it changes from crescent to full phase, and in studying the polarization of light reflected from different parts of the surface.

Russian astronomers are also making a detailed investigation of the possibility that gases are flowing from Alphonsus Crater, as Prof. Nikolai A. Kozyrev reported seeing during 1958.

Photographic observations of the moon against the background of surrounding stars are being made by Kh. I. Potter, Pulkovo's chief astronomer. Object of the program is to define more accurately the theory of the moon's movement, and to study the irregularity in the earth's rotation rate caused by the shifting of masses on the earth's surface and inside it. Prof. Potter has already obtained more than 200 photographs.

A large double refracting telescope for making detailed studies of the moon's surface features is scheduled to be installed at Pulkovo Observatory's mountain station near Kislovodsk.

Details of the expanded lunar observing program are reported by the U. S. Department of Commerce's Office of Technical Services.

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## GEOLOGY

**Find Asteroid Site In West Texas**

SIERRA MADERA, a "deranged and jumbled" geological structure in western Texas, has been found by Government geologists to be the site where an asteroid from outer space exploded as it struck the earth about 50,000,000 years ago.

Geologists visiting McDonald Observatory, jointly operated by the University of Texas and the University of Chicago, based their conclusions on the abundance of "shatter cones" in the area. These cones are small structures that indicate disruption of rock by an intense shock wave such as can only be caused by meteoritic impact and not by volcanic explosion, they said.

The cones were found in greater abundance than in any other similar structure in the world.

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# CE FIELDS

## ACOUSTICS

### Deafening by Loud Noise Reduced by "Packaging"

THE DEAFENING effects of exposure to severe noise can be reduced by "packaging" the exposure into short, widely spaced doses.

Two scientists from Indiana University told the Acoustical Society of America meeting in Cleveland that exposure to intense noise may produce a partial deafness that is permanent. To learn more about the factors involved in deafening, Drs. James D. Miller and Charles S. Watson tested cats trained to respond to test sounds.

Using these trained animals, the effects of noise on hearing sensitivity were found by means of hearing tests similar to those used for humans. First, Drs. Miller and Watson determined the duration and intensity of noise severe enough to produce a sizable hearing loss in the cats. Then they tried a much shorter exposure to this same noise and found that this did not produce permanent deafness.

Using this short and harmless exposure as a package, animals were exposed repeatedly until the total time in the noise added up to the duration that had produced deafness during a single exposure.

They found the amount of hearing loss was reduced by rest intervals between successive exposures to noise. When rest periods were very long, little or no permanent loss of hearing was measured.

The best protection against noise-induced deafness is reduction of the intensity of the noise to safe levels, they reported. However, in cases where noise reduction is impossible, they suggested that personnel could be rotated on and off duty according to a schedule that would prevent permanent hearing damage.

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## PUBLIC HEALTH

### Find Little Danger to Genes From TV

THE POSSIBILITY of the television viewer's receiving a damaging dose of radiation while watching the screen is "extremely remote."

Even from the genetic point of view, the amount of radiation emitted by the conventional TV set appears reasonable, two researchers at the Francis Delafield Hospital's physics laboratory, New York, report.

Field and laboratory tests have shown the yearly average radiation dose is at least less than five percent the dose due to the average natural background radiation to the gonads, Drs. Carl B. Braestrup and Richard T. Mooney report in *Science* (Oct. 23). Using highly sensitive instruments to meas-

ure the low level of radiation emitted by television sets, the scientists reached these conclusions after considering such factors as the viewing panel and glass, the distance between viewer and set, and the amount of time spent in TV watching.

However, the possibility of somatic, or non-inheritable, injuries to personnel during testing and servicing TV sets should not be overlooked, the scientists point out.

They explain their tests involved only the panel of the television tube. Radiation transmitted by the funnel and other parts of the tube may be greater, they suggest. Also, radiation levels as high as one roentgen per hour have been measured for other types of television tubes. (One suggested maximum exposure to radiation, not including background radiation, for the years from conception to age 30 is 10 roentgens.)

Work involving closed circuit television, electron microscopes and theater-projection-type TV tubes should not be considered safe until this has been established by dependable radiation measurements, Drs. Braestrup and Mooney say.

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## PHARMACOLOGY

### Synthetic Penicillin May Make "Shot" Obsolete

A SYNTHETIC penicillin pill will soon be available, Bristol Laboratories, Syracuse, N. Y., announced.

The new compound, Syncillin, promises to make the penicillin injection obsolete, Dr. Amel R. Menotti, Bristol scientific director, said.

Early tests indicate the synthetic antibiotic will not give as many persons the dangerous allergic reactions attributed to penicillin "shots," Dr. Menotti explained. It seems that the enzyme penicillinase, produced by some microorganisms, is not as active in destroying Syncillin.

When given orally, the new antibiotic appears to be more potent than several injectable or other oral forms of penicillin. It produces twice the blood activity of potassium penicillin V, for example. In test tube studies, the synthetic penicillin destroyed staphylococcal strains that are resistant to other penicillins.

Syncillin is a colorless, crystalline material that is very soluble in water but relatively impervious to decomposition by acids. It does not seem to be affected very much by air or light, nor does it pick up much water from the air around it.

Described as the first of the "unnatural" penicillins, the new drug is potassium alpha-phenoxethyl penicillin. A synthetic chemical chain has been added to the basic skeleton of the original penicillin which is still made by molds, Dr. Menotti said.

Large-scale trials of the new drug have yet to be completed.

Announcement of the synthetic penicillin was made as part of the dedication ceremonies of the Bristol Laboratories' new \$1,250,000 research facilities near Syracuse.

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## VITAL STATISTICS

### Women Marry Younger, Have Larger Families

MORE WOMEN are marrying at an earlier age and having larger families than they did 20 years ago, statistics show.

There were 41,500,000 married women in March of 1958. This is 3,750,000 more than there were in 1950 and 11,333,000 more than in 1940, Metropolitan Life Insurance Company figures reveal.

The rise has occurred mainly in younger women—those 18 or 19 years of age are marrying at the rate of one in three as compared to one in five in 1940. Among the 20 to 24 age group, two-thirds are married as against only half 20 years ago.

The birth rate has shot up too. In 1940 there were 125.9 births per 1,000 married women aged 15 to 44, while in 1956 this figure rose to 158.8 per 1,000 married women.

Larger families are becoming quite common, statisticians point out. The birth rate for third and fourth children more than doubled between 1940 and 1956. The rate for a fifth child almost doubled also. Furthermore, seven of every 10 babies are born to mothers under 30 years of age.

Nearly one-third of these American wives, or 13,000,000, were in the labor force in March, 1958. Reflecting the tendency of wives to seek work after their children grow up, nearly two out of every five married women in the 45 to 54 age group have jobs outside the home.

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## ENGINEERING

### Russia Builds A-Plants For Producing Electricity

RUSSIA IS now constructing two electric power plants that will run on atomic energy.

Back from a trip to Russia, Dr. Frank K. Pittman, director of the U. S. Atomic Energy Commission's division of reactor development, said stations are being erected at Voronezh and Byeloyarsk. Both will have electric outputs of 200,000 kilowatts.

Two other stations, respectively, are being built in Czechoslovakia and Yugoslavia.

The indications, he said, are that Russia's atomic power program is moving along with many of the same up's and down's as the United States program. This particularly applies to electricity production at a price competitive with power made with conventional fuels.

Russia already has an atomic power plant operating at Obninsk, producing 5,000 kilowatts of electricity. The U. S. station at Shippingport, Pa., rated at 65,000 kilowatts, can be operated at 100,000 kilowatts or modified to produce 150,000 kilowatts, Dr. Pittman said. The nation's 180,000-kilowatt Dresden station, near Chicago, already has gone critical and full power production is expected by mid-1960.

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