

Ill-Gotten Frogs, Lobsters to Be Watched

► **THE LAW IS** closing in to protect all those frogs, oysters, crabs and lobsters pulled illegally from ponds, bays and oceans.

Even the alligator will be helped before he disappears forever from the world, victim of greedy people who desire his sturdy mottled hide for purses and shoes.

These and other wildlife creatures may be given greater protection by a request sent Congress by the Department of the Interior. This would extend enforcement of already existing criminal statutes covering offenses against wildlife to halt people from transporting any wild animal killed or captured in violation of state, Federal or foreign law.

The amendment would stiffen the authority for making arrests and would broaden the definition of wildlife to include reptiles, mollusks, shrimp, crabs and other creatures. It would help curb, for instance, the million-dollar-a-year racket of illegal killing of alligators and selling and transporting their skins. Violators are fast depleting the alligator supply by slaughtering them illegally. Raw hides five to six feet long can bring \$6 a foot.

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PLANETOLOGY

Variations in Mars' Surface Height Found

► **REGIONS** on the surface of Mars vary in height by as much as three miles, measurements made during the Mariner 4 fly-by of the red planet last July indicate.

The changes in strength of radio waves as the Mariner probe passed behind Mars held the clues to the height variations. The radio occultation measurements indicate that the Electris area of the Martian southern hemisphere is some 16,500 feet higher than the northern hemisphere's Mare Acidalium.

Dr. Arvydas J. Kliore of California Institute of Technology's Jet Propulsion Laboratory in Pasadena revealed the 16,500-foot height at an international symposium of the Committee on Space Research, or COSPAR, in Vienna. The measurements were deciphered by Dan L. Cain and Gerald S. Levy of JPL, and Dr. Von R. Eshleman and Gunnar Fjeldo of Stanford University, and Dr. F. D. Drake of Cornell University for the National Aeronautics and Space Administration.

Mariner 4's radio beams were recorded during the probe's entire flight to the planet. The height variations were discovered from changes in the radio waves during the 54-minute swing behind Mars at a distance of about 16,000 miles.

Dr. Kliore reported these readings indicated the surface feature that first interrupted the radio signal during the 54-minute occultation period was at a radial distance of 3,384 kilometers from the Martian center. The radius at the point where Mariner emerged from behind Mars was found to be 3,379 kilometers.

The measurements also showed that the surface atmospheric pressure in the northern exit area appeared to be higher, from seven to 10 millibars, than that at the southern entry area, from four to seven millibars. This difference is another possible indicator that the entry point was higher in elevation.

In another report to the same meeting, Dr. Richard M. Goldstein of the Jet Propulsion Laboratory reported that the rotation rate of Venus has been pinned down. It turns on its axis in a clockwise direction only once every 243 days. Venus is the only planet known to spin in a retrograde, or backward, direction.

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MEDICINE

Medical Care Hampered By Lack of Radiologists

► **THE SHORTAGE** of experts on radiation and the health hazards resulting from the increasing use of radioactive sources in industry and medicine is seriously hampering medical care in the United States.

Because of the growing use of radioactive materials, nearly twice as many persons trained in radiological procedures are needed as are now available. Their training should also be improved, a report to the Public Health Service by the National Advisory Committee on radiation urged.

The Committee, headed by Dr. Russell Morgan of Johns Hopkins Hospital, Baltimore, recommended that the PHS "take immediate steps to strengthen its programs in the radiological sciences" by unifying its direction. Unless radiological services are improved, Medicare and the three-pronged program to combat cancer, heart disease and stroke can be seriously affected. The report urged that PHS undertake extensive training, as well as research and development programs, to upgrade the quality of all radiological services.

Surgeon General William H. Stewart has appointed Assistant Surgeon General Richard A. Prindle to review activities and to propose the actions necessary to alleviate the personnel shortage and solve other problems.

The Committee's survey of public health problems was made because of the growing nationwide use of ionizing radiation sources, particularly in the health professions. The PHS was told it must "play an important role in the prevention of undue exposure of the population from medical, occupational and environmental sources."

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IN SCIENCE

SPACE

1,076 Man-Made Objects But Not the Right One

► **THOUGH** the faulty Agena rocket that doomed the Gemini 9 mission May 17 failed to get into orbit, there were 1,076 other man-made objects up there that day to pick from.

The Smithsonian Astrophysical Observatory keeps careful track of everything that goes up and everything that stays there. Unfortunately for the disappointed GT-9 crew, not a single one of the objects is good for docking practice. Most are just useless space-junk—burned-out rocket stages and dead satellites—or satellites like the weather-watching Nimbus series.

Even the one Agena that is in orbit is no help. Its orbit is almost twice as high as it should be for docking and the power supply which runs its lights and radar beacons has expired.

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PHYSIOLOGY

Rare Five-Legged Rat Born in Litter at FDA

► **THE BIRTH** of a five-legged rat with internal abnormalities has surprised researchers at the U. S. Food and Drug Administration. The mother had taken no drugs, and the rest of her litter of 12 was normal.

The white rat, named the Monster, lived 32 days with a double urogenital system and two anal systems. He was the only animal among some 30,000 rat pups to be born with such a variety of abnormalities during the entire history of the FDA's bureau of scientific research.

One other rat had been born with an extra leg, but it was on the side. Monster's fifth leg grew directly under his tail. He apparently had no nervous control of the leg, which was without the long thighbone.

Dr. John J. Alleva, an endocrinologist in the division of pharmacology, told *SCIENCE SERVICE* he had been studying the effect of lighting on ovulation when Monster put in his appearance. As soon as one of the brother rats has reached maturity he will be mated with the mother in an effort to find out if there is some hereditary factor in the monstrosity.

If the mother lives long enough she will be mated successively with the other males in the litter in further experiments aimed at explaining the deformity. The inbreeding may show whether Monster was the result of genetics or environmental conditions.

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THE FIELDS

TECHNOLOGY

Coal Utility Increased By Conversion Method

➤ A NEW METHOD for increasing the utility of coal by converting it to higher valued gas and liquid products will be initiated by Avco's Space Systems Division, Wilmington, Mass., under contract to the U. S. Department of Interior's office of coal research.

The program is being funded under a three and a half year, \$1,821,000 contract.

In order to convert coal into gases and liquids, it is necessary to fragment its complex molecular structure. Avco intends to accomplish this by vaporizing coal in an electric arc reactor. This Avco-developed electric arc process makes possible an extremely rapid decomposition rate of coal, together with a high yield of gases and liquids, and a minimum of char formation.

Converting coal to gas and liquid products will upgrade its economic potential by reducing costs of storage and handling when used as fuel, and creating new chemicals with many significant industrial uses. Among these chemicals are ethylene and acetylene, the basic ingredients of plastic, and many organic chemicals such as solvents and pharmaceuticals.

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PSYCHOLOGY

Arousal Center Located In 'Core of Brain'

➤ THE "CORE of the brain" apparently contains the basic mechanism for arousing man and animals to excited activity or depressing them to a state of lethargy.

New evidence locating the arousal center came from Dr. Sebastian P. Grossman, professor of psychology at the University of Chicago. His work indicates how excitability and depression work together to produce balanced behavior in rats and presumably humans.

The core is the reticular formation—the brain's oldest and most primitive portion, found in all animals, Dr. Grossman told SCIENCE SERVICE. Actually it is a spreading network of nerve cells located in the upper part of the brain stem and portions of the thalamus. Connections lead from the reticular formation to all other parts of the central nervous system.

When Dr. Grossman injected small doses of acetylcholine (a chemical

that stimulates activity in brain and other nerve cells) into the brain stems of rats, they became active and highly sensitive.

If an electric shock was given, apparently it was more painful than before the injection because the rats worked harder to avoid it.

Indeed, so excitable were the animals that they had trouble with simple tasks they knew well, such as running a maze.

But, when acetylcholine was injected into thalamic portions of this brain core, the rats became inactive. They did not respond to the signal that warned of electric shock, though they finally jumped when the shock came. Nor did they run through mazes or press levers. Evidently the chemical had stimulated a blocking mechanism, said Dr. Grossman.

It is not clear, he said, in *Discovery*, 27:19, 1966, whether this blocking mechanism operates on memory or arousal.

By stimulating either portion of the reticular formation, brain stem or thalamus, he was throwing the entire system off balance, said Dr. Grossman. Normally, the two probably work together in keeping behavior reasonable—neither frenetic nor lethargic.

Since man has a reticular formation similar to the rat's, Dr. Grossman said, it probably works in the same way.

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ORNITHOLOGY

Lapwings Fly Atlantic After 39-Year Lapse

➤ AFTER A LAPSE of 39 years, lapwings have once again been recorded as having crossed the Atlantic from England to Canada.

The daily bird counts organized by the British Trust for Ornithology have shown big movements of birds including skylarks, fieldfares and redwings.

As many as 8,900 lapwings were counted crossing the coast at one spot, Kenfig, Glamorgan, during a three-hour period on Dec. 27. This is said to be "a rather conservative" figure since the passage was in progress before and after the actual count took place.

A fortnight later, 670 lapwings were counted at a point on the Hampshire coast.

In the first week of January there was a report that lapwings had landed in New Brunswick, Canada. Later, others appeared in Nova Scotia, Newfoundland and Quebec.

The birds appeared to have been caught up in a strong easterly air flow which extended from England and Southern Ireland to Canada.

This is the same as what happened when large numbers of lapwings descended on Newfoundland in December 1927.

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PHYSICS

New Technique Accurate To One Part in 10 Million

➤ A NEW TECHNIQUE that can be used to measure the changes taking place when a tiny, single crystal of salt is heated only one degree F. was reported in London.

The method of measuring changes in the structure of a crystal lattice is accurate to one part in 10 million. The high-precision X-ray technique was devised by four scientists at the Atomic Energy Research Establishment in Harwell, Berkshire, England.

They reported in *Nature*, 210:720, 1966, that even higher accuracies will be possible when their method of X-ray diffraction is improved. The technique involves using a specially designed instrument called the "automatic precision X-ray goniometer."

Determinations of the changes in crystal structure are most accurate when made in a vacuum, T. W. Baker, J. D. George, B. A. Bellamy and R. Casner have found.

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ASTRONOMY

New Telescope to Join 200-Inch on Palomar

➤ A NEW 60-INCH telescope designed especially for use with electronic and photographic observation instruments will join the 200-inch instrument, now the world's largest, atop Mt. Palomar in California.

Announcement of the one-million-dollar installation was made by the presidents of the two institutions that jointly operate the Mt. Wilson and Palomar Observatories, Dr. Lee A. DuBridge of California Institute of Technology and Dr. Caryl P. Haskins of Carnegie Institution of Washington.

The National Science Foundation has made a grant of \$590,000 to help finance the new telescope. A three-story domed observatory building, to be named in memory of the late Oscar G. Mayer, will be constructed with a \$250,000 grant from various members of the Mayer family. Mr. Mayer was board chairman of the meat processing firm, Oscar Mayer & Company.

Work on the project will begin with the grinding of the quartz glass optical mirror at the Observatories' headquarters in Pasadena, Calif. The telescope is scheduled for completion early in 1970.

The 60-inch instrument will permit more efficient operation of the 200-inch and the 48-inch telescopes on Mt. Palomar, as well as the 60-inch and 100-inch telescopes on Mt. Wilson. It will be highly effective for important photometric observations not requiring the large light-gathering power of the world's largest telescope.

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