

ZOOLOGY

Hidden TV Monitors Animal Breeding Cage

► AN EXTREMELY SHY mother animal now tends her newborn baby in peace, serenely unaware that her actions are being watched by human eyes by means of a closed-circuit television.

A day-and-night watch was maintained on England's rare captive okapis by Reginald Greed, director of the Bristol and West of England Zoological Society. With monitors placed in his own office and at other points, the zoo staff watched the actual birth of the baby. Now visitors can watch mother and child without disturbing them.

The baby and his parents, Mazanga, the father, and Bakeda, the mother, are the only okapis in any European zoo. Okapis are inhabitants of the Congo and are members of the giraffe family, with shorter legs and necks, and striped legs and thighs. Like giraffes, they are by nature extremely shy. Often zoos cannot breed or raise rare animals because the creatures' sensitive, shy nature and fear of man prevent them from doing what comes naturally.

The far-sighted zoo curator, however, has been so successful at solving the privacy problem with the hidden camera that the director of the Dudley Zoo in the English Midlands adopted the same idea for the birth of a giraffe. A third English zoo, at Flamingo Park, installed closed-circuit TV in order to keep a lonely orangutan named Alec happy when a contagious heavy cold separated him from his constant cage companion. Now he contentedly watches the antics of his former cell mate on his private television set.

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DENTISTRY

Tooth Decay and Loss Prevalent in Adults

► AN ADULT in the United States most likely has at least 20 of his teeth either decayed, filled or missing.

Dental examinations of a large sample of the U.S. adult population have revealed a "staggering total" of two and one-quarter billion decayed, missing and filled teeth, the U.S. Public Health Service reported in Washington, D.C. The dental findings by the Public Health Service were part of a nationwide health examination survey.

In the survey Negroes were found to keep their teeth longer than whites. White adults were twice as likely as Negroes to have lost all their natural teeth, either in one or both jaws. The average number of decayed, missing and filled teeth in Negroes was only about two-thirds of that found in whites. Destructive periodontal disease that affects the tissue supporting the tooth was found to occur in three Negroes to every two whites, however.

The adult sample, ranging in age from 18 to 79, had an average of 20.4 decayed, missing and filled teeth per person, with 13.5 teeth classed as missing, 5.7 filled and 1.2 decayed.

More than 20 million persons had lost all 32 of their permanent teeth and almost 10 million more had lost all 16 teeth in either the upper or lower jaw, the survey showed.

"This means that among every 100 adults an estimated 18 had no natural teeth at all, while nine others had natural teeth in only one jaw."

Sex was also found to be a factor in tooth loss. More women than men had lost all their permanent teeth, the study showed. The mean number of decayed, filled and missing teeth was generally higher for women than for men of comparable age. Periodontal disease, however, was less prevalent in women.

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PHYSIOLOGY

Brain Stores Same Data In Many Different Places

► THE HUMAN BRAIN may well have six to ten places in which the same information is stored.

Important information may be classified by the brain in such categories as "who, what, when, where, why and how." Most persons, for instance, clearly recall what they were doing at the time and immediately after they learned about the assassination of President John F. Kennedy.

The various classifications made by the brain are interconnected, Dr. Julian H. Bigelow of the Institute for Advanced Study, Princeton, N. J., reported to the Tenth Air Force Office of Scientific Research Seminar in Cloudcroft, N. Mex. Dr. Bigelow is a world authority on cybernetics, the comparative study of the control method of the brain and nervous system with computers.

The brain, he said, has an estimated 10 billion cells for storing knowledge and each of these cells is believed to have many storage states.

However, despite this "enormously large" number, the brain "works quite successfully as an information retrieval system," Dr. Bigelow reported.

One reason for this, he believes, is the interconnected ways in which information is stored in the brain. Removal of parts of the brain by surgery, when no more than 30% of the cortex is cut out, usually allows a human to retain complete brain function and complete memory recall.

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CHEMISTRY

Three Extra Electrons Added to Molecule

► CHEMISTS have known for years that some molecules can be made to accept one or perhaps even two extra electrons, but nobody thought it possible to add any more than that. Now a study has shown that three can be added.

Dr. Nathan L. Bauld of the University of Texas and co-workers have come up with a new species of richly colored organic compounds in which one, two and even three extra electrons were added.

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IN SCIENCE

METEOROLOGY

Scientists Go Higher To Study Air Turbulence

► SCIENTISTS are now going all the way to 100,000 feet in space to explore the mysteries of clear air turbulence (CAT)—the invisible bursts of rough air that often make airplane passengers think they are riding roller coasters.

Air Force pilots will soon start flying U-2 jets up to altitudes above 14 miles, collecting information about HI-HICAT (High, High altitude clear air turbulence). This is the future realm of the hypersonic transport (HST), successor to the supersonic transport (SST). HST's may travel at speeds approaching 12 times the speed of sound and at altitudes up to 100,000 feet.

The U-2 planes in the HI-HICAT study will be armed with eight-foot-long "gust probes" protruding from their noses. Painted red and white like barber poles, the probes are sensitive enough to detect a man's breath, yet strong enough to withstand the buffeting of the rough air.

The study, an extension of an earlier one at lower altitudes, is being done by the Lockheed-California Company, Burbank, under contract from the U.S. Air Force.

CAT is both invisible to the eye and undetectable by radar, so engineers at present build large safety margins into aircraft components, using up needed weight. As speeds and altitudes increase, the penalties of safety margins become more severe.

The new study is trying to determine the proper instrumentation necessary for a proper investigation. Lockheed and the Air Force have been jointly pursuing CAT since 1963.

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TECHNOLOGY

New Method Measures Level of Liquids

► A NEW METHOD of measuring the level of liquids in containers has been devised. A pressure-balance system developed by the Barton Instrument Corporation, a subsidiary of International Telephone and Telegraph Corporation, eliminates the necessity, in most installations, of mounting a meter at or near the bottom of the vessel in which liquid is to be gauged, thus making it possible to obtain accurate and reliable measurement and control from a distance of up to several hundred feet.

It operates by sensing the effect of the weight of the liquid on the air pressure in a sealed immersed sensor; a remote measurement of the air pressure gives a direct indication of the amount of liquid above the sensor, and hence of the height of the liquid in the container.

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E FIELDS

MILITARY SCIENCE

'Drive-in' Ship Launched For Military Purposes

► A "DRIVE-IN" SHIP, designed to transport battle-ready military trucks, tanks and equipment from one port to another in a hurry, has been launched.

In normal operation, the ship, called the T-LSV-9 Sea Lift, will dock so that the vehicles can be driven right on board. Riding down between-deck driveways, they would then continue under their own power to pre-assigned parking places. The speed in getting mobile material on and off quickly is expected to make the Sea Lift a valuable military transportation tool.

The ship, which is 540 feet long and has a deck area of more than two acres, is the largest vessel of its kind ever made. Designed by the Navy Bureau of Ships, it was built by Lockheed Shipbuilding and Construction Company in Seattle, Wash.

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PHYSICS

Bomb Radiation Similar To That of Lightning

► SUMMER LIGHTNING storms are being carefully checked in Los Alamos, N. Mex., to discover a positive way of telling a lightning flash from the clandestine blast of a nuclear device in space.

The program to detect and probe lightning strokes is essential to Project Vela, aimed at spotting nuclear explosions in space in possible violation of the Test Ban Treaty.

Because a nuclear detonation liberates many of the same kinds of radiation as does lightning, it is very important to distinguish one from the other.

If this could not be done, the electronic sentries monitoring the radiation might cry "Cheat!" simply because of a thunderstorm.

At the site where the lightning studies are being conducted, there is an unlimited view of the surrounding mountains from which the summer storms come tumbling down.

Included in the far-reaching vista are the peaks of the Magdalena Mountains, some 150 miles south of Los Alamos. At 10,640 feet on one of the mountains is the Irving Langmuir Laboratory for Atmospheric Physics. Scientists from the two locations can coordinate their observations of lightning strikes occurring between the two points.

In a nuclear burst much of the energy comes off first as X-rays. These travel unimpeded through space until they encounter the atmosphere, which occurs at an altitude of about 60 miles.

Air offers a barrier to X-rays, converting the radiation to visible light that is especially conspicuous at a wavelength of 3914 angstroms. This bluish glow, characteristic

of excited nitrogen, can also be seen in aurora.

More important, however, is that lightning hurling toward earth from a thunder cloud causes visible radiation at 3914 angstroms.

Some other characteristic of lightning must, therefore, be found to combine with the nitrogen signal to tell the flash from a bomb burst.

Such a characteristic is what the scientists are hoping they will find from their summer studies.

The research is sponsored by the Atomic Energy Commission and the Advanced Research Projects Agency of the Department of Defense. Conducting the studies are the Los Alamos Scientific Laboratory; the British Atomic Weapons Research Establishment; Edgerton, Germeshausen and Grier, Inc., Cambridge, Mass.; the Denver Research Institute of Denver University, and the U.S. Air Force.

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AGRICULTURE

Square Pineapple Made To Economize Processing

► TO SAVE PROCESSING, pineapples can now be square. The new variety was produced by the Tropical Fruit Research Station at Alstonville, near Lismore, New South Wales.

It took five years of intensive research and experiments with 25,000 pineapple plants to develop it.

Experts estimate the development will save tens of thousands of dollars in labor costs and cut wastage in the pineapple canning industry.

This is true because the conventional round-shouldered pineapple posed problems of economic peeling and coring. Too much of the flesh is lost in the processing.

The new type is a juicier, better-looking pineapple and has no rough end.

D. S. Leigh, manager of the research station, estimated it would take five years to produce the new type in commercial quantities.

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TECHNOLOGY

New Machine Makes Stronger Fiberboard

► THE STACKING STRENGTH of shipping containers can be increased 30% to 40% through the use of corrugated fiberboard made on a new machine invented by K. Q. Kellicutt, engineer in charge of packaging research at the U.S. Forest Products Laboratory in Madison, Wis. Application for a patent on the machine has been made.

The greater top to bottom compressive strength of containers is brought about by a different method of assembling the linerboard and corrugated sheet on the machine into double-faced, single-wall corrugated board. In addition, the new machine requires less steam than presently used machines, and takes up less floor space.

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DENTISTRY

Antibiotics Help Reduce Dental Tartar Formation

► SIGNIFICANT REDUCTIONS of dental calculus or tartar in animal experiments were shown by brushing and use of antibiotics, an Iowa dental research scientist reported.

Calculus is considered a major cause of gum disease. Adult cats whose teeth were brushed either daily or twice weekly during an 18-week period, with toothbrushes having soft nylon bristles, developed 95% less calculus than animals whose teeth were not brushed, Dr. R. L. Richardson, Iowa City, reported in Dental Abstracts, August 1965.

Even brushing once a week reduced the amount of calculus formed by 76%, he added.

During the test, six groups of adult cats received daily injections for 18 weeks of different antibiotics and one group received a sterile saline solution injection.

Dr. Richardson stressed that all antibiotics tested decreased the amount of calculus formed. This new information supports the theory that bacteria contribute to the formation of dental calculus and that interfering with their growth or metabolism retards or reduces dental calculus formation.

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AGRICULTURE

Sulfur May Increase Yield of Winter Wheat

► SULFUR added to nitrogen in fertilizer may increase the yield of stubble-mulched winter wheat, the U.S. Department of Agriculture reports.

In recent tests, two soil scientists of USDA's Agricultural Research Service, Fort Collins, Colo., found that the availability of soil sulfur was part of the reason for decreased yields on some stubble-mulched fields, even those fertilized with nitrogen.

The imbalance is caused by microorganisms that decompose the wheat straw. Besides nitrogen, they use up soil sulfur as well.

Bobby A. Stewart and Charles J. Whitfield who analyzed the effects of wheat-straw decomposition in soil reported that wheat grown in the soil-straw mixture yielded considerably less vegetation than wheat grown in containers of plain soil. The Colorado Agricultural Experiment Station cooperated in the work. Addition of nitrogen fertilizer increased yield in the soil-straw mixture more than in plain soil, but yields were still highest in the soil without straw.

When sulfur was added with the nitrogen, plants grown in the soil-straw mixture yielded as much as the check plants, indicating that the added sulfur replaced the available soil sulfur being used by the microorganisms in decomposing the straw.

Results of this study also explain why legumes respond to sulfur fertilization. By fixing atmospheric nitrogen in the soil, they upset the natural nitrogen-sulfur ratio.

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