

## TECHNOLOGY

**New Cartridge Stuns For Painless Slaughter**

➤ A NEW CARTRIDGE that stuns livestock with one shot makes the animal insensible to pain before slaughtering.

The tiny projectile, when it strikes, disintegrates into thousands of tiny "sponge iron" particles that blanket the nerve centers in the animal's brain. It will not harm workers 15 feet away and is not toxic to meat.

Stunning is part of the Government-approved method of humane slaughtering of livestock. The U. S. Department of Agriculture regulations were specifically amended to include the new cartridge method. The cost of using the cartridges is about one and a half cents a head of livestock.

The .22 caliber long rifle cartridge was produced by Winchester-Western Division of the Olin Mathieson Chemical Corporation.

• Science News Letter, 83:40 January 19, 1963

## ANIMAL HUSBANDRY

**Hot-Iron Cattle Brands Replaced by Ribbons**

➤ RIBBONS are replacing hot-iron branding of cattle.

A new method of identifying cattle both individually and for the herd is using notched, plasticized nylon ear ribbons. The particular herd is recognized by the color of the ribbon and the specific animal in the herd by a notch code on the ribbon.

Besides cattle, the ribbon device has been used to mark wild geese, mountain sheep, elk and even grizzly bears. A hole is punched in the animal's ear, in cattle behind the muscle in the middle of the ear. An ear-button with the same number that is notched on the ribbon holds it in place.

The ribbon device is reported by E. J. Woolfolk, range conservationist, of the U.S. Department of Agriculture's Forest Service, Berkeley, Calif.

• Science News Letter, 83:40 January 19, 1963

## ENTOMOLOGY

**Scientists Find Why Insects Resist Poisons**

➤ SCIENTISTS are taking the offensive in breaking down insects' resistance to DDT and other insecticides. The first target is the common housefly.

A group of entomologists at Rutgers' College of Agriculture, headed by Dr. Andrew J. Forgash, are studying the resistance of flies, after exposure to Diazinon, an organophosphorus insecticide, as well as DDT and lindane, chlorinated insecticides.

Their findings reveal that the more resistant flies absorb insecticide through their bodies more slowly than flies that have not developed tolerances.

DDT-resistant flies have the ability to convert the insecticide to a new chemical called DDE. This is accomplished with an enzyme which is present in greater quantity

in the DDT-resistant flies. A change of a single atom in the DDT molecule will stop the effectiveness of this enzyme, although the fly's defense mechanism is gone only temporarily. It will eventually adapt to the new chemical.

The Rutgers group is using radiophosphorus to determine which portion of the fly's body accepts or rejects the insecticides.

• Science News Letter, 83:40 January 19, 1963

## AGRICULTURE

**Sudan Grass an Effective Barrier Against Erosion**

➤ FARMERS can protect their land from wind erosion by planting Sudan grass as a barrier.

Sudan grass proved to be the best of four crops tested by the Agricultural Research Service of the U. S. Department of Agriculture at Akron, Colo., to reduce soil blowing.

Crop barriers of Sudan grass, grain sorghum, forage sorghum and broomcorn were planted and wind-speed measurements were made during the normally windy period of December, January and February, when erosion hazard is great. The minimum speed at which wind erosion begins is 14.25 miles per hour measured one foot above ground surface.

Spacing of barrier strips, stalk size and height of grass are important factors in providing effective protection against wind. One-row plantings generally gave less protection than two rows.

The study was conducted by agricultural engineer D. W. Fryrear.

• Science News Letter, 83:40 January 19, 1963

## PSYCHIATRY

**Docile Monkey Replacing Aggressive Type in Lab**

➤ ANOTHER monkey, the stump-tailed macaque, is replacing the rhesus monkey in the psychiatrists' laboratories. The macaque is gentler and does not scratch and bite as much as the rhesus.

The macaque, species *Macaca speciosa*, is native to northern India, Tibet and Western China. It is a docile, easily managed monkey even when not trained and accustomed to extensive handling. The rhesus monkey, *Macaca mulatta*, is belligerent and aggressive to persons in the laboratory.

Scientists have found it possible to capture the animals without pinning the macaque's arms behind its back as was necessary with the rhesus.

Emotional reactions and intelligence of the two species are similar. If a macaque is frustrated in a learning situation, it will sulk and shriek, although it does not usually resort to physical violence such as the scratching and biting characteristic of the rhesus monkey.

The study of the monkeys as research animals was reported by Drs. Arthur Kling and J. Orbach of the institute for psychosomatic research and training, Michael Reese Hospital, Chicago, in the journal, *Science*, 139:45, 1963.

• Science News Letter, 83:40 January 19, 1963

**IN SCIEN**

## TECHNOLOGY

**Voice Cameras Probe Human Speech**

➤ THE MYSTERIES of human speech are being probed with cameras and X-rays. Ultra-high-speed motion picture cameras equipped with complex mirror systems are being used to photograph human vocal cords as sound is produced. Electronic devices measure frequency and volume of vocal sounds and coordinate them with the voice movies. This study of the human voice is being done by the Communication Sciences Laboratory at the University of Florida, Gainesville. A major phase of the work is the taking of X-ray motion pictures showing a cross-section of the vocal cords in action.

• Science News Letter, 83:40 January 19, 1963

## TECHNOLOGY

**New Artificial Leg Gives Natural Walk**

➤ A REVOLUTIONARY type of artificial leg is being issued by the Veterans Administration to eligible veterans.

For above-the-knee amputees, the leg has a hydraulic knee mechanism designed to permit more graceful and efficient walking, with less energy required.

The mechanism offers a more natural gait at any of a wide range of walking speeds. Ankle and knee motions are coordinated to reduce walking effort.

User-acceptance of the new leg, which contains fluid of the same composition used in planes taken to the Arctic, was rated high.

• Science News Letter, 83:40 January 19, 1963

## ANTHROPOLOGY

**Chinese Tomb Find Shows 7th Century Musicians**

➤ A DOZEN POTTERY figurines of musicians were recently unearthed from a Tang-Dynasty tomb some 30 miles from Sian in the Yellow River Valley, China. The Tang Dynasty (618-907 A.D.) was an age famous for its sculpture and other arts. The find is rare because of the artistic quality of the figures and the variety of musical instruments represented.

Some of the musicians are on horseback. The pottery horses, complete with harness, are modeled in lively style. There are also figures of warriors. All are finely painted. Glazed pottery, valuable murals and more than 500 other funerary objects were found in this Seventh century tomb and are now on display in a museum near Sian. These finds provide important data for the study of the culture, customs and life of the aristocrats of that time.

• Science News Letter, 83:40 January 19, 1963

# CE FIELDS

## CHEMISTRY

### Pesticides in Foods Detected by New Means

► INSECTICIDES in foods can now be speedily detected in the modern laboratory.

Analytical techniques that once took two days are now being done more accurately in less than two hours. The insecticides appear as residues on sprayed food.

With more than 250 organic pesticides on the market, it may take 20 years to develop adequate analytical checking methods, Paul Mills, Food and Drug Administration chemist, said.

He has devised a method of determining the pesticide content of eggs. It involves the separation of the halogens present in natural body compounds such as thyroxin and phospholipids from pesticide halogen residues in the body. The pesticide halogens are dissolved in acetone. This work is part of a national survey being undertaken in the study of pesticide residues in eggs.

Another technique is used to measure DDT in butter and vegetable oils. The method, an application of electron-capturing, gas-liquid chromatography, is capable of measuring DDT in tiny quantities.

A new method for analyzing milk for pesticide residues, using colorimeters, takes from about two to 11 hours.

• Science News Letter, 83:41 January 19, 1963

## GEOLOGY

### Fossils Are Found Underwater in Florida

► CLEAR STREAMS facilitated the underwater find of the greatest concentration of fossils in Florida, discovered in a river location unannounced to protect it from "fortune hunters."

The most "startling" fossil discovery in the two million-year-old "bone yard" was that of a large flightless bird, a rhea, native to South America, Dr. J. C. Dickinson, director of the Florida State Museum, told SCIENCE SERVICE.

The identification of the bird was made by Dr. Pierce Brodtkorb, internationally known ornithologist at the University of Florida. He said this is the first record of such a bird in North America.

Other fossil finds, identified by Dr. Clayton E. Ray, University of Florida biologist, included those of a small antelope never before found east of the Mississippi, giant bison, two species of camels, an extinct horse, a giant land tortoise measuring five feet in length, a beaver the size of a black bear and an extinct ground sloth.

The largest pocket of fossils in the river near Gainesville is 30 feet square and lies only eight inches below a layer of algae in the river bed. Underwater locations make fossil recovery simple, by doing the digging for the searching paleontologists.

The age of fossils ranges from shark teeth that are 25 million years old to remains of modern beaver and the flat-tail muskrat, said Dr. Ray.

The fossil bed was discovered by three skin-divers, Robert Allen, Jerry Hooker and Ben Waller, who have given their finds to the museum. They believe that the surface of the find has hardly been scratched. The exact location of the find has not been made public to prevent amateur investigators from invading.

The bones are found approximately 200 yards from where they washed into the river. Dr. Ray believes the fossil deposits resulted from normal dying along the river bank.

• Science News Letter, 83:41 January 19, 1963

## CHEMISTRY

### Growth-Retardant to Aid In Grass Fire Prevention

► A COMBINATION of a growth-retarding chemical and a fire-preventing chemical is being developed to prevent grass fires along state highways caused by cigarettes and engine sparks.

In experiments begun in 1961 in California, grasses along highways are sprayed with a growth retardant after having been sprayed with a fire-retarding chemical, diammonium phosphate. Because this chemical releases about 67 pounds of nitrogen per acre into the soil, it could trigger fast growth of new grass during the winter rainy season, creating a greater fire hazard the next spring.

The state officials hoped that the growth-retarding chemical will overcome the stimulus of the nitrogen and keep the grasses about four inches in height. When the grass becomes tinder dry the following spring it will be again treated with the fire-retarding chemical.

Officials believe that combining the fire-retarding and growth-retarding chemicals will prove more satisfactory than the use of soil sterilants that kill off grass growth and could cause soil erosion problems.

The growth-retarding chemical used was MH-30, a product of the Naugatuck Chemical division, U.S. Rubber Co.

• Science News Letter, 83:41 January 19, 1963

## SPACE

### Earthbound Spacecraft Simulates Flights

► A NEW earthbound "spacecraft" will simulate flights 50 miles above earth to test men and equipment under a variety of extremes without leaving the ground. It is a chamber weighing 114,000 pounds and can hold 14 students plus two instructors. The new space chamber can reach a peak altitude of 79,000 feet for flight personnel and altitudes of up to 250,000 feet for equipment. It was designed by the Martin Company's Space Division, for the Navy, and installed at the Philadelphia Navy Yard.

• Science News Letter, 83:41 January 19, 1963

## TECHNOLOGY

### Continuous Washing For Paper Machine

► THE GREAT ROLLS of felt that take the water out of the ribbons of paper made on paper machines now can be washed automatically. A new system developed by Economics Laboratory of St. Paul, Minn., uses a non-foaming detergent in special pumps for cleaning and conditioning the felt on which the paper is formed.

• Science News Letter, 83:41 January 19, 1963

## SPACE

### First Space Fling This Year Named 1963-1

► THE SPACE scientists are almost in the same fix as the old lady who lived in a shoe: they have so many satellites and space probes that they have switched beginning with 1963 from Greek letter names to Arabic numerals.

The first space vehicle for science this year would be 1963-1 and so on. It would have been Alpha under the previous system. The new naming has been sanctioned internationally by Committee on Space Research (COSPAR) and nationally by National Aeronautics and Space Administration and Department of Defense which fling the objects into space.

• Science News Letter, 83:41 January 19, 1963

## GEOLOGY

### Geologists Seek Clue To Island Relations

► GEOLOGIC TIES between the Samoan and Hawaiian Islands are being studied with paleomagnetic methods.

Australian scientists use a technique based on the reversal of magnetism in rock samples to provide an accurate "marker horizon" for age estimates of rock formations on Pacific islands. It was found that "reversals" took place in the Hawaiian and Samoan islands in the Pleistocene and Pliocene periods (more than one million years ago). The level of the most recent reversals in the islands corresponds with other geologic estimates of age.

Expeditions in the past two years collected the 728 magnetically oriented rocks which were used in the study. Scientists are continuing research to make correlations between the geologic formations on the two island groups.

The magnetic reversal method of studying age is based on the fact that rocks can be divided into two groupings. The younger rocks are magnetized in line with earth's magnetic field, while older rocks have undergone a "reversal" and are aligned magnetically in the opposite direction. The reversal took place in the beginning of the Pleistocene period of geologic time.

This research was reported by Dr. D. H. Tarling, Australian National University, in Nature, Dec. 1, 1962.

• Science News Letter, 83:41 January 19, 1963