

## TECHNOLOGY

**New Army Hospital Travels With Troops**

► A NEW PORTABLE Army hospital, equipped with an expandable operating room and inflatable recovery wards, can go where the troops go.

The hospital, called MUST (for Medical Unit Self-contained Transportable), has just been developed for the Army Medical Service. Designed to provide quick medical and surgical care near the front lines, it can be put into full operation 30 minutes after arrival at a new location.

The MUST, which eventually may also help solve medical problems in remote areas, natural disasters and civil defense, has three basic elements or building blocks—the utility, the surgical and the patient ward elements.

The utility element weighs 3,600 pounds and is designed around a gas turbine engine to provide electric power. This unit, which can be hauled around by a two-and-a-half-ton truck, also provides air conditioning, heating, hot and cold running water and waste disposal service.

The surgical element is a mobile, rigid panel shelter with accordion sides that can be expanded to make it three times as big. This unit will house operating rooms, pharmacies, clinical laboratories, dental and X-ray clinics. Four men can load the complete unit on a truck in ten minutes.

The third unit, the hospital ward, is a double walled fabric shelter that can be inflated in the field. Each ward can hold up to 20 combat casualties. Six men can put a shelter up or take it down in 30 minutes or less.

The MUST system is being built for the U.S. Army by the AIRsearch Manufacturing Company, a division of Garrett Corporation, Phoenix, Ariz. In addition, modern lightweight medical equipment, designed for efficient use of space, is being developed for the MUST by the American Hospital Supply Corporation, Evanston, Ill.

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## CONSERVATION

**Birth Control Planned To Halt the Coyote**

► BIRTH CONTROL rather than trapping, shooting, poisoning and maiming is a new, more humane method now underway to reduce the number of coyotes, one of the most cunning, adaptable and hated critters in the Southwest.

By dosing baits with a synthetic female hormone and dropping them in coyote-infested areas at certain breeding times, researchers can prevent female coyotes from becoming pregnant and producing large litters of young, reports Fish and Wildlife Service, US. Department of Interior.

The chemical hormone stilbestrol is most effective for preventing pregnancy in the coyotes during the first 15 days of the coyote's breeding period, about the second week in March.

Researchers plan to carry out more ex-

periments with the chemical bait this spring in New Mexico and Idaho. Last year planes dropped chemically-treated baits in selected test areas in both states. Researchers later collected samples of female coyotes from these areas to see the results—from 48% to 80% of the mature females had not been successful in giving birth.

Today there are probably more than half a million coyotes in the United States, about 85% to 90% of them west of the Mississippi. Long a foe of growers of sheep and poultry, these coyotes have been relentlessly hunted with gun, poison, traps and hounds. In some areas where this animal has become extinct, ranchers have suddenly realized the value of the coyotes in keeping down gophers and other harmful rodents.

A member of the dog family, *Canis latrans* has pointed ears and a long pointed nose. He has an acute sense of smell, alert hearing and keen eyesight. Born with innate cunning, which is sharpened by his intelligence, a coyote can live 10 to 18 years when he can outwit human hunters.

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## SPACE

**Satellite Could Show Temperatures, Pressures**

► A SATELLITE orbiting earth around the poles, measuring how starlight is bent by the high atmosphere, could indicate air temperatures and pressures.

Within a few seconds these measurements could be used to help make worldwide weather forecasts, filling in the gaps now existing over the oceans. The temperatures and pressures obtained from the polar-orbiting satellite would be at least as accurate as the readings taken now by radiosonde balloons, and possible more so for heights below 15 miles.

Frederick F. Fischbach of the University of Michigan told the American Meteorological Society meeting in New York that star-tracking equipment is sufficiently accurate to allow the instrument to lock onto and track one star after another when the satellite is on the dark side of the earth.

The star will be tracked from a height of about 25 miles above the earth's surface until its light is cut off either by clouds or by the earth itself.

The atmosphere between the satellite and the star would bend the starlight, just as it bends sunlight during a lunar eclipse to give the moon a coppery glow. The bending of starlight measured by a satellite will give the air's density directly, from which pressure and temperature can be calculated.

Each orbit would yield between 100 and 150 soundings of the atmosphere, covering the earth with some 1,600 observations daily, except in the polar area in sunlight.

The method establishes a mathematical connection between the refraction, or bending, of starlight due to the earth's atmosphere and the density of the atmosphere. A speedy computer will translate the density measurements into temperatures and pressures with a few seconds.

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**IN SCIEN**

## OCEANOGRAPHY

**Giant Waves Found Beneath Lake's Surface**

► INTERNAL WAVES as high as a two-story house plow through Lake Michigan in the summer and show little more than a ripple on the surface, scientists have found.

These waves, ranging up to 40 feet high, had been found in the oceans but never before had been proved to exist in Lake Michigan.

The waves were discovered on the thermocline, a layer of water in which the temperature differs sharply from the water above, reported James L. Verber, an oceanographer who took part in a seven-year study of the Great Lakes by the U.S. Public Health Service. The internal waves occur because of these temperature differences, Mr. Verber said.

The scientists also discovered that there is a rotary action in Lake Michigan's currents. The water was found to rotate in circles up to three-quarters of a mile in diameter and was believed to be influenced by the earth's rotation.

In addition, speeds of a little less than two miles an hour were detected in currents at depths of as much as 800 feet.

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## BIOTECHNOLOGY

**Middle Ear Examined With New Device**

► AN INSTRUMENT that will enable physicians to examine visually the middle ear with a minimum amount of discomfort to the patient is being developed at the University of Illinois College of Medicine, Chicago.

Experiments on animals indicate that the device, known as an endoscope, may become valuable in diagnosing middle ear diseases and abnormalities. Anatomical variations and pre- and post-surgical conditions can also be observed.

The endoscope, a small, round, 2.5mm-diameter probe devised by Dr. S. Bruce Mer, a resident and National Institutes of Health trainee in the department of otolaryngology, is inserted into the middle ear through a small incision on the eardrum while the subject is under local anesthesia.

The physician can observe the functioning ear by watching the electronically illuminated tip of the probe through an attached surgical microscope or by taking photographs with an attached camera.

The device permits direct observation of middle ear disease which previously was inferred from observation of the eardrum and not seen until surgery.

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# CE FIELDS

## PUBLIC SAFETY

### New Device Forerunner Of All-Electric Highway

► AN AUTOMATIC warning device to prevent auto accidents is being forecast as the forerunner of an all-electric highway.

This, followed closely by the introduction of control devices to regulate merging traffic at freeway accesses, was seen as the first application of a highway network rigidly controlled by electronics to regulate speed, traffic flow and reduce accidents.

This look into the future of highways was presented to the American Road Builders Association by its president, M. L. Shadburn, at the 63rd annual convention in Washington, D.C.

The road builders heard a bright future for highway transportation during the next 20 years, despite recent proposals for jet capsule commuter transport and monorail. Before the car gives way to other forms of mass travel, other significant road developments are seen.

Cars, for example, will become more uniform in size and performance for easier parking and more efficient highway use.

The piggy-back principle of hauling truck trailers by rails will be applied to passenger cars for long distance travel.

Added emphasis will be given to highway esthetics and safety.

In Mr. Shadburn's view, the next highway program may feature road and traffic signals that speak to the driver.

"Audio signing to supplement visual signing, for the surveillance and metering of traffic to obtain the most efficient use of highway space, particularly for downtown sections of freeways."

In analyzing the future of the auto in America, Mr. Shadburn forecast an increase to 121 million vehicles in 1980, one for every two persons, as compared to 86.2 million in 1964.

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## PHOTOGRAPHY

### New 3-D Photo Allows Looking Behind Objects

► A NEW METHOD for making three-dimensional pictures that allows the viewer to see behind objects merely by changing his position was demonstrated in Washington, D.C. (See SNL 86:311, Nov. 14, 1964)

U.S. Senators, Congressmen and the 40 most talented young scientists who are seniors in the country's high schools were given their own 3-D "pictures" made using a laser technique.

The method is so new that the holograms, as they are called, are the first to be made directly available to individuals.

The extremely bright, highly intense light of a laser beam is needed to make the holograms. The method is too difficult for use by professional and amateur photographers.

When projected, the pictures are much more realistic than conventional stereo, since they give a change in perspective with a change in position.

The method for making the 3-D laser pictures was developed by Emmet N. Leith and Juris Upatnieks of the University of Michigan, based on earlier work of Dr. Denis Gabor of the Imperial College of Science and Technology, London.

A hologram is produced by illuminating an object with light from a laser in such a way that both the light reflected from the object and that reflected from the laser beam directly by a mirror are recorded simultaneously on film. This technique forms a diffraction pattern, giving a film of uniform color with no recognizable objects or images.

However, when the film is projected upon a screen with a laser light behind it, the 3-D effect is clearly seen without any special viewing equipment, such as polaroid glasses. This is because light from the object carries information about depth, as well as size, shape and tone, when split to form a diffraction pattern and then recombined.

Dr. John W. Coltman, director of mathematics and radiation research and development at Westinghouse Research Laboratories, Pittsburgh, Pa., demonstrated the new method for making 3-D pictures at a dinner meeting of the 24th Science Talent Search, which is administered by SCIENCE SERVICE and sponsored by the Westinghouse Educational Foundation.

Dr. Coltman also showed color images formed by what are called liquid crystals, which have most of the properties of a liquid but also a crystal structure resembling a solid.

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## TECHNOLOGY

### Computer Will Handle Navy Personnel Records

► THE FUTURES of the more than one million men and women in the U. S. Navy may even now be written on computer cards.

What is described as a "highly advanced manpower information system, using five IBM/360s, will provide virtually instant access to an inventory of the skills and talents" of everyone in the Navy.

The new data processing system is designed to do the following for the Navy:

1. Obtain on demand personnel management information.
2. Forecast personnel requirements of existing and future weapons systems.

In addition to facts, the system may provide, by storing information on education, training, experience and location of personnel, forecasts of the potential abilities of all Navy personnel on active duty as well as reserved and retired personnel.

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## GENERAL SCIENCE

### Five Scientists Named For Lawrence Award

► FIVE U.S. scientists have been named to receive the Ernest Orlando Lawrence Memorial Award for 1965 for recent meritorious contributions in the field of atomic energy, Dr. Glenn T. Seaborg, chairman of the U.S. Atomic Energy Commission, announced.

Each scientist will receive a medal, a citation and \$5,000.

The award will be presented at a ceremony on April 29 at the National Academy of Sciences building in Washington, D. C.

Those honored are:

Dr. George A. Cowan, Los Alamos Scientific Laboratory, Los Alamos, N. Mex.

Floyd L. Culler, Oak Ridge National Laboratory, Oak Ridge, Tenn.

Milton C. Edlund, Babcock & Wilcox Company, Lynchburg, Va.

Dr. Theodore B. Taylor, Defense Atomic Support Agency, Washington, D.C.

Dr. Arthur C. Upton, Oak Ridge National Laboratory, Oak Ridge, Tenn.

The award was established by the commission in December 1959, in honor of the late Nobelist, Dr. Ernest O. Lawrence, inventor of the cyclotron and director of the Radiation Laboratory at the University of California, Berkeley and Livermore, which bears his name.

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## MEDICINE

### Research Monkeys Set For Population Study

► A COLONY of about 600 rhesus monkeys will be studied to give more light on human reproduction, birth control and the world's population problem.

The colony, one of the largest in the world for research purposes, will be set up at the University of Pittsburgh under a \$500,000 grant from the Ford Foundation.

Indian short-tailed rhesus monkeys have proved most useful to researchers because they are hardy and relatively easy to handle. About 60% of the research primates, as apes and monkeys are called, imported each year into the United States are rhesus. These creatures have helped scientists eliminate yellow fever, malaria and polio. The "Rh" used in the term Rh negative and positive of blood types was taken from the beginning of the monkey's name.

The largest Ford grant, three million dollars, to expand U.S. research into the world's growing population went to the University of Michigan, which conducts basic social research and training and offers assistance to less-developed countries on birth control methods.

The University of Pennsylvania received \$700,000 to set up a new division of reproductive biology. Other grants were given to Princeton University, the University of Kansas Medical Center and Beth Israel Hospital, Boston.

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