

## PUBLIC SAFETY

**Cause of Long-Trip Car Crashes Studied**

► THE CAUSE of automobile accidents on long trips is the subject of a study at the University of California at Los Angeles that will take five years and involve 25,000 motorists.

Here is a typical situation that will be investigated:

Mr. Jones left Los Angeles early on a weekday morning for a cross-country car trip on U.S. Route 66. He reached Flagstaff, Ariz., some 450 miles away, toward late afternoon and with an easy stretch of road ahead, decided to push on to Albuquerque, N. Mex., for his overnight stop.

Somewhere between Flagstaff and Albuquerque, Mr. Jones, a safe driver in a new car on a first-rate road, missed a slight curve, his automobile rolled over, and Mr. Jones was killed.

What caused the accident? Was it something that happened a split-second before he lost control, or a long chain of causes that started 500 miles and 10 hours earlier?

This is what a group of engineers and psychologists at UCLA's institute of transportation and traffic engineering will try to determine. Their answers may open a new line of research on driving safety.

The project, entitled "Long-Trip Driving Habits of California Drivers," will be directed by Robert L. Mellinger, Robert Brenner, and Slade Hulbert of UCLA, under a grant from the California Highway Transportation Agency, and with the cooperation of the California Division of Highways, Department of Motor Vehicles (DMV), and the California Highway Patrol.

• Science News Letter, 87:56 January 23, 1965

## DENTISTRY

**Antibiotics May Help Stop Tooth Troubles**

► DIRECT APPLICATION of antibiotics and fluoride gel in the consistency of gelatin before it sets has stopped both tooth decay and gum disease in the hamster.

A small plastic mouthguard about the size of a thumbnail was filled with the mixture and placed over the hamster's palate and teeth for a few minutes at a time at the National Institute of Dental Research, Bethesda, Md., where the same technique has been started with humans.

Dr. Paul H. Keyes of the Institute staff told the American Dental Association meeting in San Francisco that because of the highly successful animal experiments he recommends clinical trials be started.

The antibiotics eliminated bacteria harmful to the teeth and gums, and with the fluoride, reduced the hard, crustlike plaque that was deposited on the surface of the teeth. Plaque is composed chiefly of minerals from the saliva, bacteria and other substances found in the mouth.

During the experiment, the test animals were inoculated with microorganisms and fed high carbohydrate diets, which caused them to develop rampant dental decay and a form of gum disease.

The animals were not treated until plaque had formed on the teeth and evidence of incipient disease was detectable, Dr. Keyes said. This took about seven to ten days.

The antibiotic, spiramycin, was very effective in suppressing plaque. When the antibiotic treatment was discontinued, however, both decay and gum disease returned. But in animals that received fluoride gel in addition to the antibiotic therapy, new dental decay did not recur after both medications were discontinued.

Challenges facing the dental profession today, Dr. Keyes said, are to find appropriate drugs for plaque control and to prepare suitable formulations of these agents; to develop new methods of application suitable for handicapped as well as normal, cooperative persons; to demonstrate the efficacy and safety of these methods, including the absence of undesirable changes in the normal substances in the mouth.

Direct tooth applications can be attained not only by gels in mouthpieces, but in adhesive pastes and powders, in lozenges, chewing gums and in various mouthwashes, the scientist said.

• Science News Letter, 87:56 January 23, 1965

## GEOLOGY

**Study Earth's History And Magnetic Personality**

► SCIENTISTS ARE UNEARTHING new clues on earth's past history and taking new readings on its magnetic personality.

By studying tiny trapped water bubbles in ancient pumice, by using airplanes to scrutinize large magnetic variations in the earth's crust, and by using modern computers to locate and measure ground water, scientists are finding new clues about present secrets and past history of our planet. Results were reported at the 77th annual meeting of the Geological Society of America in Miami.

Millions of years ago, water bubbles were trapped in pumice formed by volcanic eruptions, reported E. Roedder and R. L. Smith of the Department of Interior's Geological Survey in Washington, D.C. With time, the trapped water diffused into the pumice walls and a vacuum was formed in each tiny bubble.

Then gradually, ground water moved slowly through the walls and filled the sealed bubbles. The amount of water in the bubbles can give a rough measure of the age of the rock sample under study.

Large variations in magnetic intensity "of major crustal significance" were reported by I. Zeitz, of the Geological Survey, W. Geddes of the U. S. Naval Oceanographic Office and F. G. Lidiak of the University of Texas in Austin. Flights were made along a 1,600-mile-long path, over a 100-mile-wide strip of land from Denver, Colo., to Washington, D. C.

By using maps that only a computer could produce from enormous quantities of information, scientists are learning more about locations of the earth's underground water and spots to drill new wells, reported Profs. Robert B. Johnson, of Purdue University and H. Grant Goodell of Florida State University.

• Science News Letter, 87:56 January 23, 1965

**IN SCIEN**

## FORESTRY

**Pellets Save the 'Good,' Kill the 'Bad' Trees**

► TINY PELLETS the size of aspirin tablets can destroy unwanted trees and at the same time keep young needed trees thriving—all in the same forest.

In forests where low-quality trees are growing, desirable seedlings can be planted underneath the existing trees. When the seedlings are growing well, between four and ten pounds of fenuron pellets are strewn over each acre. This herbicide, chemically 3-phenyl-1,1-dimethylurea, is absorbed by the hardy root systems of the older trees, but is not picked up by the young roots of the new seedlings.

Pellets of fenuron were effective in forests of undesired scrub oak under which grew valuable pine seedlings, Dr. Robert D. Shipman of Pennsylvania State University, University Park, reported to the Northeastern Weed Control Conference in New York.

The leaves of the scrub oak began withering within a week after application, leaving the pine seedlings healthy and vigorous. When the oaks are completely dead, they can be removed and harvested for paper pulp, and the pines gain much needed space, water and nutrients to grow into economically useful timber.

This method of selective tree killing provides foresters with a new tool for gradually converting stands of pole-sized, worthless hardwood into coniferous or valuable hardwood plantations, Dr. Shipman said.

The herbicide is drawn up into the tree with the ground water from the roots to the leaves. Once in the leaves, the fenuron begins to kill the tree by depleting its chlorophyll supply so the leaves wither and die.

• Science News Letter, 87:56 January 23, 1965

## STATISTICS

**Life Span Increases During Past 120 Years**

► LIFE EXPECTANCY for the average white male born in 1960 is 37 years greater than if he had been born in 1840, Metropolitan Life Insurance Company statisticians report. The man born in 1840 could expect to live 38.7 years, but the comparable figure for one born in 1960 is expected to be 75.5 years.

In 1840 about one-fourth of the white males died before reaching their second birthday. Even 50 years later one-fourth lived to be only a little more than six years of age. Those born in 1910, however, lived past age 42 before their generation was reduced by one-fourth. Since then survivorship has improved.

• Science News Letter, 87:56 January 23, 1965

# CE FIELDS

## CHEMISTRY

### Simple Compound Made by Irradiation

➤ A SIMPLE CHEMICAL compound, which could have been formed on earth long before life as it is now known evolved, has been created in the laboratory under primitive earth conditions.

The compound, cyanamide dimer, could have played a role in the chemical evolution that is believed to have led eventually to life forms. It is a key compound in causing the formation of more complicated molecules.

The cyanamide dimer was made by ultraviolet irradiation of dilute cyanide solutions and by electron irradiation of a mixture of methane, ammonia and water.

Ultraviolet and ionizing radiations are believed to have been present on the primitive earth and to have acted on simple chemicals to cause formation of biologically important compounds.

Chromatography and radiation were used to detect the cyanamide dimer. Dr. Anneliese Schimpl, Richard M. Lemmon and Nobelist Melvin Calvin of the University of California, Berkeley, reported in *Science*, 147:149, 1965.

• *Science News Letter*, 87:57 January 23, 1965

## MEDICINE

### Cancerous Spongy Bones Recalcify With Fluoride

➤ THE FIRST REPORTED case of recalcification or restoration of lost minerals to the bones through massive doses of fluoride is described in the *New England Journal of Medicine*, 26:271, 1964.

The patient was a 55-year-old woman with multiple myeloma, an almost fatal malignancy of the bone marrow. The spongy flat bones of her skeleton became riddled with countless cancerous tumors and there was agonizing bone pain in addition to other complications.

After 34 months of treatment in Peter Bent Brigham Hospital, Boston, Mass., by Drs. Phin Cohen and Frank H. Gardner of Harvard Medical School, the woman's bones showed progressively increased density. This treatment showed subacute skeletal fluorosis, defined as chronic poisoning of a low grade with fluorine.

While in the hospital the woman also was given a constant diet containing 1,000 milligrams of calcium each day.

The question of whether fluorosis produces bone of good quality in regard to tensile strength and weight-bearing capacity is open to some doubt, the researchers say, but they believe doctors should not be "excessively conservative" in this treatment of myeloma.

"The emergency nature of the bone problems in this disorder, coupled with the

heavy mortality within the first two years of diagnosis, requires the brisk and energetic application of any new therapy that may be beneficial," the investigators stated, adding that massive fluoride and massive calcium therapy may have to be combined, as in this case, to produce fluorosis.

Since this case was reported, three additional patients, all men with multiple myeloma, have acquired skeletal fluorosis with a modification of the first treatment.

• *Science News Letter*, 87:57 January 23, 1965

## SPACE TECHNOLOGY

### Astronauts<sup>8</sup> May Make Their Own Air on Moon

➤ ASTRONAUTS may find themselves "squeezing" water—and air—from rocks once they land on the moon.

A chemical process has been developed to produce oxygen from silicates—complex metal salts that, along with quartz, make up the greater part of the earth's crust. These metallic silicates are believed to be widely distributed on the moon.

The process will also produce water as a by-product "if water, in any form, is present in lunar materials," reported Sanders D. Rosenberg, Gerald A. Guter and Frederick E. Miller of the chemical products division, Aerojet-General Corporation, Azusa, Calif.

The method, called the Aerojet Carbothermal Process, has three essential steps:

1. The reduction of silicate with methane to form carbon monoxide and hydrogen.
2. The reduction of carbon monoxide with hydrogen to form methane and water.
3. The electrolysis of water to form oxygen and hydrogen.

Development of the process stems from Aerojet-General's research program for the National Aeronautics and Space Administration. The program is devoted to research on processes to find uses for lunar resources, particularly the manufacture of oxygen from moon minerals.

The researchers described their process at the annual meeting of the American Institute of Chemical Engineers in Boston.

• *Science News Letter*, 87:57 January 23, 1965

## AGRICULTURE

### Extracted Corn Part Delicious to Worm

➤ THE PART of the corn that tastes so good to the earworm, one of the most destructive corn pests, has been extracted by scientists of the Agricultural Research Service, of the U.S. Department of Agriculture.

The substance, which has not yet been identified chemically, was extracted from the silks and fresh kernels of corn plants. Earworms eagerly eat fiber paper that has been soaked in a solution containing this feeding stimulant.

After the water-soluble chemical has been identified and synthesized, it may provide new methods for controlling the pests, by attracting them to poisoned baits. The corn earworm is found everywhere corn is grown.

• *Science News Letter*, 87:57 January 23, 1965

## CHEMISTRY

### Chemicals Harvested From Tasmanian Sea

➤ A NEW industry is being established to produce chemicals from giant brown kelp, harvested from the sea on the east coast of Tasmania.

The seaweed will be processed into alginates, which are used primarily in processed foods, pharmaceutical and cosmetic preparations and in a variety of industrial products.

Surveys conducted by the Federal Government's Council for Scientific and Industrial Research Organization, Sidney, Australia, show the fields could eventually earn more than \$450,000 a year in export markets. Cost of establishing the industry is set at less than two million dollars.

Australia uses about 200 tons of sodium alginate a year and the company aims to start by supplying this need only. The first important outlet for alginates is as a thickening agent in the manufacture of ice cream.

• *Science News Letter*, 87:57 January 23, 1965

## PHYSICS

### Test Proposed to Check On Einstein's Theory

➤ A NEWLY PROPOSED TEST to check on Einstein's general theory of relativity uses radar waves reflected from the planets Mercury or Venus when they are on the far side of the sun from earth.

The test would measure the time delay in the reflected radar waves caused by the sun's strong gravitational field. Einstein's theory predicts that light or radio waves passing near a high gravitational field will be bent.

This has been verified by many experiments since 1919 in which the bending of light waves from distant stars by the sun's gravitation has been measured. Determining the slow-down of radio waves passing near the sun is another way of measuring this bending, or refraction, of light or radio waves by a source of strong gravitation in the vacuum of space.

The new test, which is still in the planning stage, will be possible because of recent improvements in radar equipment and techniques. It was proposed in *Physical Review Letters* (Dec. 28) by Dr. Irwin I. Shapiro of Massachusetts Institute of Technology's Lincoln Laboratory.

Dr. Shapiro suggests that the radar facility best suited for the test is the one called Haystack, developed by Lincoln Laboratory for the U.S. Air Force.

Besides the bending of light waves, two other tests have been made to verify Einstein's general theory of relativity: changes in the perihelion (point closest to the sun) of Mercury's orbit, and the reddening of spectral lines due to gravitational attraction.

The time delay expected in the reflected radar waves is only one-fifth of a thousandth of a second, but the proposed new test could provide a check if the experiment is continued for several years.

• *Science News Letter*, 87:57 January 23, 1965