

TECHNOLOGY

**"Electric Mothballs"
Keep Ships From Rusting**

► "ELECTRIC MOTHBALLS" have been devised for America's reserve fleet to shave \$3,000,000 off the annual cost of keeping idle ships in tip-top condition.

Technicians of the Maritime Administration, working with General Electric engineers, have created a system of "cathodic protection," which causes an anchor in the water to rust instead of the ship's hull.

The Maritime Administration said that the cathodic protection system would save \$3,000,000 a year over conventional methods of underwater ship protection on the 2,100 vessels now in eight reserve fleet sites.

By conventional methods, it costs about \$1,850 per year to keep the hull of one mothballed ship in good condition. This includes dry-docking, scraping and painting. By the cathodic method, this cost can be reduced to \$375 per ship per year.

Valued at \$8,000,000,000, America's mothball fleet is attacked by corrosion due to a reaction between the hull metal and water.

The electric cathodic protection system offsets this natural tendency by causing a submerged metal "anchor" to corrode instead of the valuable ship bottom. The ship forms one electrode in an electric circuit. The anchor forms the other electrode. Direct current passing between anchor and ship sets up an electrochemical reaction that does the trick.

Science News Letter, February 27, 1954

MEDICINE

**Blood Pressure Drug
Calms Mental Patients**

► A MODERN drug from an ancient medicinal plant is showing itself useful in lowering high blood pressure of some patients, calming some mental patients, and relieving monthly menopausal tension states in women.

The drug is called reserpin. It has been extracted from the root of the Indian plant, *Rauwolfia serpentina*. In India and Europe, crude extracts from this plant have been used for centuries as a remedy for insomnia, hypochondria and insanity. Its blood pressure lowering effect was discovered and reported relatively recently. (See SNL, June 13, 1953, p. 365.)

Scientists of Ciba Pharmaceutical Products, Inc., Summit, N. J., have isolated a pure form of the drug that the firm calls Serpasil.

Reserpine's ability to quiet mental patients without putting them to sleep was reported by Dr. Nathan S. Kline of Rockland, N. Y., State Hospital and Columbia University College of Physicians and Surgeons, New York, at a conference of the New York Academy of Sciences.

Such a drug that would have a sedative effect without a sleep-inducing one has been greatly needed, Dr. Kline pointed out.

When tried in 32 women, the drug had

"a mild calming and sedative effect" in tension states, premenstrual tension and in menopausal patients, particularly when these latter patients also had high blood pressure, Dr. R. B. Greenblatt of the Medical College of Georgia, Augusta, reported.

A controlled study of it in patients with high blood pressure showed it was effective in some whose disease was severe or malignant. It also showed itself useful in patients being treated with other drugs lowering blood pressure, acting either to increase the effect of the other drugs or to suppress side effects from them. This study was reported by Drs. Harriet P. Dustan, R. D. Taylor, A. C. Corcoran and Irvine H. Page of the Cleveland Clinic Foundation and the Frank E. Bunts Educational Institute, Cleveland.

Science News Letter, February 27, 1954

METEOROLOGY

**Sun's Particles Change
Earth's Weather Pattern**

► THE FIRST direct evidence that particles thrown out by the sun at the time of a solar flare can provoke changes in the earth's weather pattern has been published.

An intense warming of the upper atmosphere immediately after the eruption of a solar flare is revealed in "Climatic Change" (see SNL, Feb. 20, p. 125). The abrupt temperature rise was discovered in records sent down by a high-flying, radio equipped balloon flying over Berlin, Germany, in February, 1952.

That solar flares should warm up the earth's outer atmosphere has long been assumed. These measurements, however, are the first direct evidence of such changes. On the morning of Feb. 24, 1952, the temperature about 90,000 feet above the earth's surface was normal—a chilly 60 degrees below zero Centigrade. At this time, a solar flare was recorded, and it was followed within 24 hours by a temperature rise of more than 40 degrees Centigrade at 80,000 to 100,000 feet. The highest temperature ever recorded at that height, 17 degrees below zero Centigrade, was observed.

"For several days," Dr. Eberhard Wahl of the U. S. Air Force Cambridge Research Center here states, "this warming could be followed; slowly, lower layers of the atmosphere were affected and on Feb. 29, the temperatures at about 40,000 to 50,000 feet had increased considerably."

A complete change in the overall weather pattern was observed during the last days of February in 1952. Low pressure systems were found near the Azores, which usually have highs. A snowstorm which hit New England at the time is believed by Dr. Wahl to have been a result of this chain of events.

The peculiar behavior of the upper atmosphere was first discovered by Prof. R. Scherhag, chief of the analysis section, German Weather Service in the U. S. Zone, Bad Kissingen, during routine upper atmosphere studies.

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IN SCIENCE

VETERINARY MEDICINE

**Radioactive Isotopes
Help Cattle Research**

► RADIOACTIVE ISOTOPES have been used to study the effects of antibiotics on mastitis in dairy cattle, Dr. A. R. Drury of the Michigan State College School of Veterinary Medicine has reported.

Mastitis is one of the major disease threats to the dairy industry. Antibiotics mixed with isotopes were injected in diseased cows. The course of the drugs in combating the infection was traced by the radioactivity.

The experiments showed, Dr. Drury said, that early treatment is necessary if the antibiotics are to do any good. Large quantities of the antibiotic were found to be absorbed in the cow's system and eliminated without any local effect on the infection.

At early stages of the disease and in mild cases, the antibiotics proved helpful in treatment of mastitis.

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MEDICINE

**Calories More Than Fat
Control Artery Disease**

► THE BEST way so far known to treat the serious artery condition called atherosclerosis is to prevent or correct overweight, in the opinion of Dr. F. J. Stare of Harvard University.

Atherosclerosis is the kind of so-called artery hardening associated with increases in the blood serum of two kinds of fatty material, cholesterol and fat-protein particles. Some patients with this artery trouble have been put on rigid diets to exclude foods that would be sources of these fatty substances.

However, Dr. Stare and associates find that when an overweight person loses some 19 pounds of weight, there is a decrease in these fatty materials in his blood. Their study showed that when patients continued to consume more calories than they needed to maintain their weight, the two types of fatty materials continued at a high concentration in their blood, even when the fat content of the diet was low.

On a low fat diet, the cholesterol content of the fat had no apparent effect on the cholesterol or fat-protein particles in the blood serum.

Apparently patients can have the advantages of a good diet, with meat, eggs and milk, while bringing their weight to normal range and thus, presumably, helping the state of their arteries.

The studies by Dr. Stare and associates were made with a grant from the Nutrition Foundation.

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CE FIELDS

GEOPHYSICS

Clue to Uranium in Lead Isotope Amounts

► A NEW clue to deposits of uranium is the amount of different isotopes of lead in rock formations, Dr. Paul E. Damon of the University of Arkansas reports. Isotopes are chemically identical, but have different nuclear structures.

The new clue is based on the assumption that uranium deposits were formed at the same time as the earth's crust, and have not undergone much change since then. It would also apply to deposits of radioactive thorium.

Uranium and thorium minerals, being radioactive, decay over a long period of time to lead isotopes that are known as "radiogenic" lead. Radiogenic lead looks and behaves like ordinary lead, but can be separated from it by delicate physical methods.

The amount of radiogenic lead compared to the amount of ordinary lead is an indicator of the earth's age, as well as the time of mineral deposit formation. Dr. Damon studied figures for lead isotope ratios found recently by other scientists for rocks from all over the world.

He suggests that similar studies in the future will show where to search for uranium and thorium deposits.

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MEDICINE

Heart Stops, Restarted Four Times in 10 Days

► AN "UNUSUAL" case of a patient whose heart stopped and was restarted four different times within 10 days is reported by Drs. Brooke Roberts, Truman G. Schnabel, Jr. and I. S. Ravdin of the University of Pennsylvania Hospital and School of Medicine, Philadelphia, in the *Journal of the American Medical Association* (Feb. 13).

A strong, sharp blow on the chest was enough to restart the patient's heart twice, but on the next two episodes this was not enough, and the doctors had to open her chest and massage her heart and, one time, give electric shocks to get her heart beating in effective rhythm again.

The patient, a 68-year-old housewife, suffered a fifth attack of heart arrest which she did not survive.

The Philadelphia doctors stress three points in their report:

1. This patient's heart was stopped three times for longer than four minutes, which is usually accepted as the upper limit for effective restoration, yet she had full return of consciousness and did not seem to have

suffered significant permanent damage to the brain and nervous system after the first two heart arrests.

2. The forceful blow on the chest should be tried more often in cases of heart arrest, because it may save opening the chest to massage the heart and also it can be done sooner, perhaps while a knife is being gotten for opening the chest.

3. Deficiency of potassium, not just in the blood serum but also in the cells of the body, due to prolonged diarrhea and inadequate absorption, may have caused the irritable heart condition and episodes of heart arrest in this patient. At the time, she was in the hospital recovering from a second intestinal operation.

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MEDICINE

Medical Care Quality Threatened by Aliens

► THE QUALITY of medical care in the United States is threatened by the rapid influx of foreign doctors, many with inadequate professional training, Dr. Willard C. Rappleye, dean of the Faculty of Medicine, Columbia University, New York, charged at the Congress on Medical Education and Licensure in Chicago.

He pointed out that the United States government, in fostering international good will, is admitting large numbers of displaced persons, including physicians about whose professional ability no questions are asked. More will be admitted by recent legislation permitting the entrance of several hundred thousands of immigrants above the previous quotas.

"The infiltration of the medical profession of the United States by large numbers of doctors who have not been able to obtain a proper basic professional education is almost certain to lower the general level of practice in this country during the next several decades," Dr. Rappleye said. "The numbers coming in are so large that they cannot readily be absorbed without that effect.

"The mode of entrance is largely through internships and residencies. Medical boards and administrations of many hospitals are more eager to secure the services of these individuals than to provide the highest quality of professional care to patients or to conduct a satisfactory training program."

To maintain the high standards of medical licensure, practice and education in this country, he made two recommendations:

1. Smaller hospitals and municipal institutions should provide a supervised educational experience for recent medical graduates, and hospitals that cannot provide satisfactory training and guidance of the house staff should seek some other method of discharging their responsibilities to patients and the community, including the employment of properly trained physicians on a salary basis. 2. Graduates of foreign schools by practical examinations should be better screened.

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MEDICINE

Seeks MS Control Clue In Bacteria of Earth

► SEARCH FOR clues to control of the disabling nerve disease, multiple sclerosis, or MS for short, has turned to the soil which gave us such disease-fighting chemicals as streptomycin.

MS is a disease in which the myelin cover of nerves is destroyed. The earth may hold bacteria that attack myelin, Dr. Albert Schatz of the National Agricultural College, Bucks County, Pa., thinks. If such bacteria can be found, scientists may be able to learn how myelin is altered and find chemicals to stop such alteration and destruction.

To aid Dr. Schatz in the search for such bacteria, the National Multiple Sclerosis Society has given a research grant.

The cause and cure of multiple sclerosis are not known. It is estimated that about a quarter of a million Americans have this disease. They may suffer from such widespread symptoms as eye, speech, and gait defects, paralysis, bladder weakness and tremors.

Multiple sclerosis, which usually attacks persons in the 20 to 40 age group, is generally progressive; while many victims are ambulatory, others use crutches and wheelchairs, and some advanced cases are confined to bed.

Science News Letter, February 27, 1954

AGRICULTURE

New England Farms More Fertile Now Than in 1776

► NEW ENGLAND farms are more fertile today than when Continentals and British redcoats fought over them in the Revolutionary War, Dr. C. L. W. Swanson, head of the soils department at the Connecticut Agricultural Experiment Station, New Haven, has reported.

For the past 200 years the gradual development of fertilization has made the naturally infertile New England soil more fertile, Dr. Swanson said.

His report was partially based on a study made by the Northeastern Soil Research Committee. This study found that more nitrogen, phosphorus and potash are being returned to New England soils each year than crops are using. The cultivated soils are, however, low in organic matter and in poor physical condition.

New England soils have always made farming difficult. Dr. Swanson said that when the Puritans landed the top soil was no more than two or three inches thick. In comparison, the top soil of the prairie in Iowa when it was settled often measured 12 to 18 inches thick.

The light, sandy soils of New England respond readily to fertilizer applications. Their single-grained structure also allows nutrients to become quickly available to plants.

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