

MEDICINE

New Operation Restores Man's Swallowing Ability

► A SURGICAL feat which restored a man's ability to swallow holds hope for veterans who can't swallow because of war injuries. The operation was developed by a team of surgeons at the University of California Medical School with the aid of X-ray motion pictures, monkeys and rerouted muscles.

The patient had been forced to take all his food through a tube leading to the stomach as a result of a gunshot wound which had severed several nerves essential in swallowing. He had been despondent and was on the point of suicide when he came for help to the surgeons.

The man is now living a normal life, working at manual labor and is able to eat just what did happen.

The physicians, Drs. Howard Naffziger, Cooper Davis and H. Glenn Bell, made a careful study of the whole subject of swallowing, then the patient by means of X-ray motion pictures. They found the swallowing mechanism was so complex and so rapid that it was necessary to run the pictures in slow motion in order to see just what did happen.

On the basis of their studies, they produced the same effect in monkeys by severing the proper nerves. They then performed the operation which was successful.

They discovered that several key muscles were paralyzed in the throat of the patient which prevented movement of the Adam's apple. This was remedied by attaching a new set of muscles to the bone just above the Adam's apple. The man also suffered from choking when he swallowed because the injured muscles ballooned out into the side of the neck. The physicians used healthy tissue to pin back these muscles.

This new operation is reported in the *ANNALS OF SURGERY*, (Oct.-Nov. 1948.)

Science News Letter, February 26, 1949

CHEMISTRY

Fireproof Lubricants Made from Fluorocarbons

► FIREPROOF lubricants which do not thicken with cold or thin from the heat of an engine may find important military applications as well as civilian use.

Fluorocarbons, chemical compounds containing carbon and the gaseous element fluorine, were discussed by scientists at a conference sponsored by the Office of Naval Research in Washington.

As lubricants, chemists foresaw possible use of fluorocarbons under extreme conditions such as in flaming jet aircraft engines or for the small gyroscopes on gun mountings which are now being run at higher speeds than they were during World War II.

Hydraulic brakes which take up the energy of recoil of guns and catapult launching devices for aircraft on shipboard may use fluorocarbon fluids in the future.

Cost of fluorine gas to use in forming these unusual chemical compounds was cited as a factor limiting present production. But the unusual ability of these compounds to resist burning may make them worth almost any price, representatives of jet aircraft manufacturers indicated.

Important properties as an electrical insulator may make a fluorocarbon type of synthetic rubber important. Manufacturers of synthetic rubber are following this possible development, it was disclosed at the conference.

Science News Letter, February 26, 1949

GENERAL SCIENCE

Science Refresher Course To Be Given Teachers

► SCIENCE teachers, who, like the rest of us, have difficulty in keeping up with the rapid progress of modern science are going to get some help.

Fifty secondary school teachers will get a six-week refresher course in science at the Massachusetts Institute of Technology in Cambridge, Mass., this summer. They will study new advances in science on fellowships granted by the Westinghouse Educational Foundation. A total grant of \$62,500 will make it possible for 50 teachers to receive grants of \$250 each summer for the next five years, Dr. James R. Killian, Jr., president of the Institute, announced.

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ELECTRONICS

Voltage Distribution of Lightning Stroke Modeled

► NOBODY knows much about the voltage distribution of a lightning stroke passing through a wire, but General Electric scientists in Pittsfield, Mass., have perfected a model from photographs that may give some idea.

The completed model, in three dimensions, resembles in appearance an ordinary topographical chart to show the contour of mountain ranges. It represents the distribution voltage in a coil of wire through which a simulated lightning stroke passed for only 250 millionths of a second. It graphically shows the voltage peaks and valleys resulting from the current.

Height of the model indicates the variations in voltages, width represents time in millionths of a second. Length of the model traces the location of the impulse in the winding.

The model was made from photographs taken of oscillograph readings of the windings. The negatives were projected on fiber board, which was patterned out accordingly and mounted on a wooden base.

Science News Letter, February 26, 1949

IN SCIENCE

GENERAL SCIENCE

One in Eight Married Women Are Wed More Than Once

► ABOUT one out of every eight married women in the United States has been married more than once, statisticians of the Metropolitan Life Insurance Company in New York figure.

Widows and divorcees account for one-sixth of all recent brides, they report. Wives who have been married more than once are relatively more frequent now than at any time in the past 50 years or more.

The chances of remarriage have increased at every period of life but "the greatest improvement" is seen among widows and divorcees at the younger ages, the statisticians point out. At the 25- to 34-year-age range, more than three-fifths of widows and divorcees were remarried in 1940, compared with about one-half in 1910.

At ages 65 to 74 there has been only a slight increase in remarriages. This the statisticians find "understandable because the chances for remarriage among widows and divorcees at the ages past middle life have been adversely affected in recent decades by the growing deficit of eligible men at the older ages."

All this remarrying "as would be expected has increased the proportion of families resulting from second or subsequent marriages."

Science News Letter, February 26, 1949

ENGINEERING

Asphalt Emulsion Makes Earth Dams Water-Tight

► LEAKY EARTH dams can be made water-tight by use of an asphalt emulsion injected into the dam through driven pipes, the Shell Oil Company revealed. A permanent underground dam is built by means of the asphalt; no excavating is necessary.

The process, which has already been thoroughly tested, utilizes an emulsion known as Shellperm. In use, the asphalt preparation, mixed with water, is pumped under low pressure through a metal pipe driven into the ground. Emerging from the pipe, the emulsion spreads out roughly in the form of a bell. Chemicals mixed with the emulsion cause the asphalt to coalesce, producing a mass impermeable to water.

Following the first injection, the pipe is raised, and additional emulsion applied to top the first. Later the pipe is moved to make adjacent columns until the entire dam is made leak-proof.

Science News Letter, February 26, 1949

CE FIELDS

GENETICS

New Light Shed on Corn And Pellagra Relationship

► NEW light on the relation of corn to the hidden hunger disease, pellagra, appears in a discovery of Dr. Alvin Nason, of the botany department of Columbia University,

It has long been known that people whose staff of life came from corn rather than wheat were likely to get pellagra unless they got the anti-pellagra vitamin, niacin. Corn does not supply enough of this vitamin to ward off the disease of the ugly rash, sore tongue and disordered mind.

Recently it has been discovered that tryptophan, an amino acid, is a sort of parent chemical to the vitamin, niacin. Animals and bacteria that get tryptophan plus vitamin B₆ apparently can make niacin in their bodies.

Now Dr. Nason finds that the embryos of genetically high-niacin corn will synthesize more niacin if they are fed tryptophan. And they do not need any extra vitamin B₆ to do it.

Tryptophan, however, is probably too expensive to feed to corn in order to increase the plant food's niacin content.

Science News Letter, February 26, 1949

PHYSICS

Magnetic Properties Best When Atoms Are Aligned

► MAGNETIC alloys have better magnetic properties when their atoms are in an "ordered state" rather than in their natural "hodge-podge" condition, the Physical Society of Pittsburgh was told by Dr. J. E. Goldman, Westinghouse scientist. The atoms are "lined up" by special heat treatment, he said.

The part that heat treatment plays in bringing out the better magnetic properties was recently demonstrated at the U. S. Naval Ordnance Laboratory when attempting to reproduce in this country an excellent magnetic material used by the Germans during the war. The chemical make-up was easily determined, but the heat treatment required to bring out its best magnetic properties took several years to determine.

The improvement in magnetic properties, according to Dr. Goldman, may also improve the ability of such metals to produce more powerful sound waves. Sound wave generators, using these magnetic properties, are called magnetostrictive oscillators. They are used to kill bacteria, or in underwater work to safeguard navigation or map the ocean floor.

A rod of metal, properly treated to arrange the atoms, will expand and contract a tiny fraction of an inch when subjected to an alternating magnetic field. By magnetizing such rods with a high-frequency current, they can be made to vibrate up to hundreds of thousands of times a second and generate ultrasonic waves, waves too rapid to be audible to the human ear.

"The magnetic behavior of metals and alloys is determined largely by the position of the atoms that make it up," Dr. Goldman theorized. "By carefully controlling which atoms go into what position, a process we have learned to perform in the laboratory, we can govern to a large extent the magnetic behavior of the metal and learn more about the mystery of magnetism."

Science News Letter, February 26, 1949

PHYSICS

Soft Iron Holds Magnetism Longer at Low Temperature

► PROOF of correlation between temperature and retention of magnetism in soft iron magnets has been produced by a 17-year-old student at New Brunswick High School in New Brunswick, N. J., Elihu A. Boldt. His experiments were performed on the dining-room table of his home, with the simplest kind of apparatus.

It has long been known, Mr. Bolt explains, that steel magnets are much more nearly permanent than soft iron ones; as a matter of fact, the latter lose their magnetism very quickly after the electric current that induces it is shut off. It is also well known that heating a steel magnet causes it to lose some of its magnetism.

These facts aroused in his mind a curiosity as to whether an opposite condition, like chilling to the temperature of dry-ice, would cause magnetism to last longer in a soft iron bar.

He placed his iron bars, with the electric coils that were to magnetize them, in insulated glass jars, which he subjected to four different temperatures: that of the room itself, the boiling and freezing points of water, and the temperature of solid carbon dioxide or dry-ice, which is almost 80 degrees below zero Centigrade. During each experiment, he placed an ordinary pocket compass near the bar, measuring the bar's loss of magnetism by the time required for the compass needle to swing away from its deflected position back to normal.

Each test was repeated 30 times, and the periods required for loss of magnetism reduced to an average. A definite correlation between retention of magnetism and lowering of temperature was demonstrated.

Mr. Boldt is one of 40 winners in the Eighth Annual Science Talent Search who will meet in Washington, D. C., March 3 through 7, to attend the Science Talent Institute.

Science News Letter, February 26, 1949

CHEMISTRY-ENGINEERING

Tracer Marks Progress of Oil Through Pipeline

► THE atomic energy equipment at the Oak Ridge National Laboratory is helping the oil industry with a tracer to show the progress of oil as it travels through hundreds of miles of pipeline, the Atomic Energy Commission revealed.

A radioactive barium isotope is introduced into the oil in the pipeline and travels with the oil. Its position can be located at any time by the use of a Geiger counter carried along near the pipe on the outside. When this instrument, the standard device used to locate and measure radioactivity, is near the barium isotope, it sends a signal to the operator's ear.

No danger results from the introduction of the radioactive barium in the crude oil. It completely disappears during the refining process. Location of the exact position of a particular sample in the oil pipeline is important for efficient direction of each type of crude oil into proper channels at the refinery.

Experiments in the use of the product of the uranium chain-reacting pile in the Oak Ridge National Laboratory are being made by the California Research Corporation, a subsidiary of Standard Oil Company of California. Results to date indicate that the method will be generally applicable to the tracing of fluid flow through pipes and to the study of the fundamental behavior of flowing fluids.

In an experiment relating to improvements in producing better petroleum fuel, the same laboratory is using radioactive carbon to learn more about what happens to gasoline molecules as they pass through the complex operations of a modern refinery.

The chemist labels a gasoline molecule by substituting a radiocarbon atom for an ordinary carbon atom.

Science News Letter, February 26, 1949

GENERAL SCIENCE

Rare Nepal Relics Given To Smithsonian Institution

► RARE relics from the little known Himalayan kingdom of Nepal have been added to the collections of the Smithsonian Institution in Washington as a tribute to American courtesy.

The bronze figures, a rock crystal lamp and other religious objects have been transferred to the Institution by President Truman, who received them as a gift from the government of Nepal for courtesies shown in Washington to trade representatives of the Asiatic country after World War II.

Long closed to foreigners, Nepal is now being explored by an American expedition sponsored by the Smithsonian, the National Geographic Society and Yale University.

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