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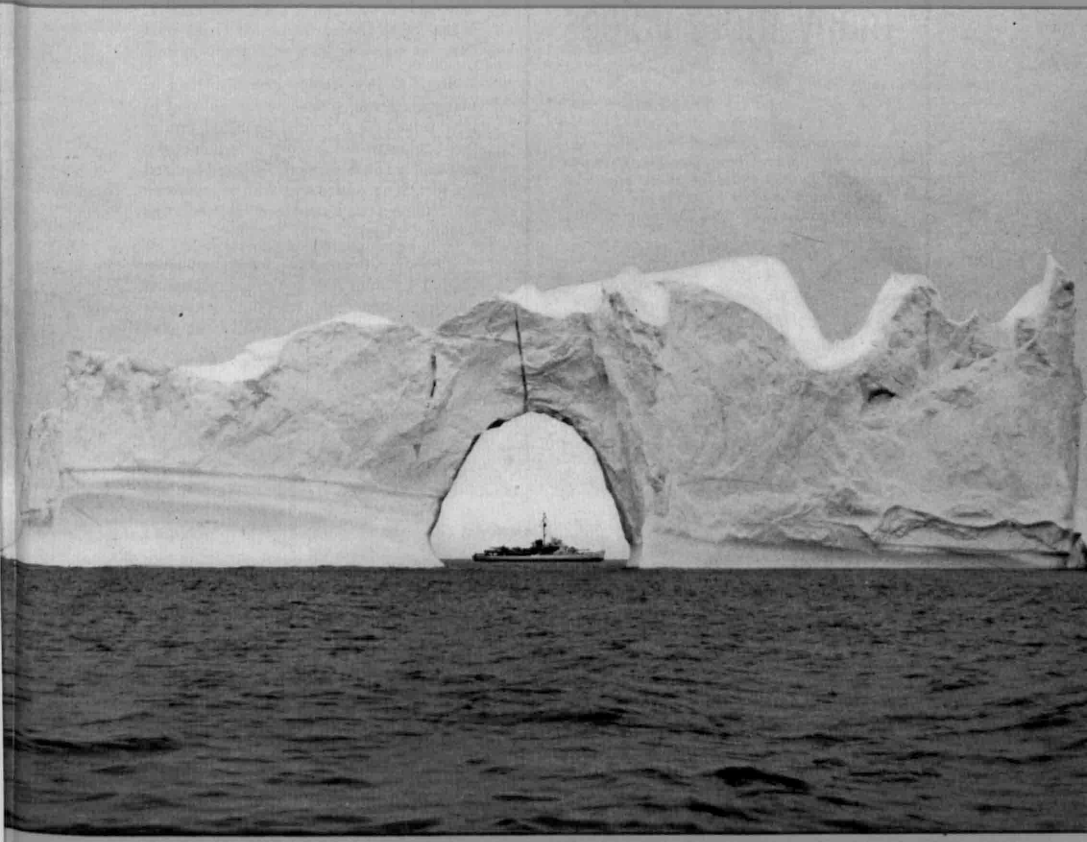
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



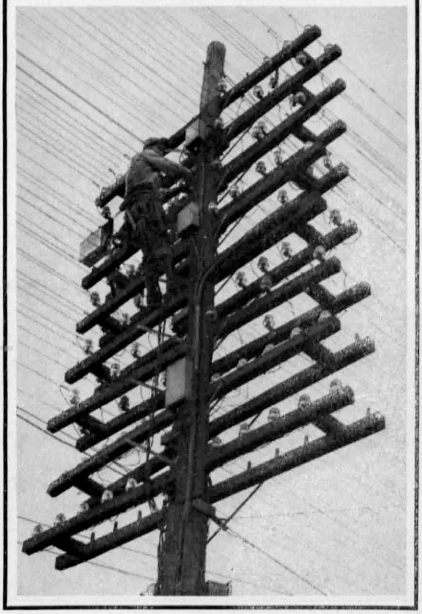
Thuleward

See Page 217

A SCIENCE SERVICE PUBLICATION

Same wires– many more voices

Connecting new multi-voice system to open-wire lines, near Albany, Georgia. With new system, 150,000 miles of short open-wire telephone lines can be made to carry up to 16 simultaneous messages economically.



MUCH of your Long Distance telephone system works through cable but open-wire lines are still the most economical in many places. Thousands of these circuits are so short that little would be saved by using elaborate carrier telephone systems which are better suited for long-haul routes. But a new carrier system . . . the Type O designed especially for short hauls . . . is changing the picture. It is economical on lines as short as 15 miles. With Type O thousands of lines will carry as many as 16 conversations apiece.

Type O is a happy combination of many elements, some new, some used in new ways. As a result, terminal equipment takes up one-eighth as much space as before. Little service work is required on location; entire apparatus units can be removed and replaced as easily as vacuum tubes.

Moreover, the new carrier system saves copper by multiplying the usefulness of existing lines. For telephone users it means more service . . . while the cost stays low.

Repeater equipment is mounted at base of pole in cabinet at right, in easy-to-service position. Left-hand cabinet houses emergency power supply. System employs twin-channel technique, transmitting two channels on a single carrier by using upper and lower sidebands. A single oscillator serves two channels.

BELL TELEPHONE LABORATORIES

Improving telephone service for America provides careers for creative men in scientific and technical fields

SURGERY

Graft Human Kidney

Experiments in transplanting kidneys and lungs, giving hope many body organs may be successfully grafted in future, reported at American College of Surgeons meeting.

➤ THE DAY when a diseased kidney can be replaced by a healthy one from either a recently dead body or a living person seems to be coming closer. This kind of organ grafting has already been done in six cases with at least temporary success in three.

The kidneys were transplanted to the thigh of the recipient. Three of the transplanted kidneys never developed any function that could be measured because of technical difficulties. The other three, after a period of non-functioning for eight to 14 days, then started functioning. The maximum urine output in one case was almost three quarts in 24 hours.

All the transplanted kidneys were destroyed by infection, but two functioned considerably longer than any reported in animals. This kind of organ grafting was reported by Drs. David M. Hume, John P. Merrill and Benjamin F. Miller of Harvard Medical School and Peter Bent Brigham Hospital, Boston, at the meeting of the American College of Surgeons in New York.

Thumbs From Index Fingers

New thumbs for lost ones are being given Korean war veterans at the Valley Forge Army Hospital Hand Center, Phoenixville, Pa. The techniques used for this are reported by Lt. Erle E. Peacock, Jr.

The new thumb is made by transplanting the patient's index finger, on its own bundles of nerves and blood vessels and intact tendons, to the base and tendons of the old thumb. This operation has been done in eight cases during the past 10 months at the Valley Forge Hospital.

Sometimes, although the thumb may function perfectly, the patient may complain that it does not feel like a thumb but like a transplanted index finger. A second operation on tendons may make it feel more like a thumb.

The new thumb not only has normal sensation and movement but an appearance not too unlike a thumb. Possibly as it is used to oppose the fingers over a long period, it will flatten and look more normal.

Replace Diseased Lungs

Surgeons may soon replace a diseased lung or other organ of the body with a healthy one from a donor.

This optimistic view, amounting almost to a prediction, was given by Drs. Wilford B. Neptune, Hector Redondo and Charles P. Bailey of Hahnemann Medical College and Hospital, Philadelphia, at the meeting.

They have succeeded in reimplanting a lung in a dog, removing it first from the animal's body and then grafting it back. The dog is alive and well, one year after the operation, and the reimplanted lung is apparently normal by all studies.

Grafting a lung from another animal has also been tried by these and other surgeons, but with less success. Commenting on these attempts, the scientists state:

"The problem is being studied by many investigators and although unsolved, should be conquered, most likely, by the combined efforts of the immunologists and tissue culture workers."

Thigh Muscle Aids Graft

A jacket or "corset" of tissue taken from thigh muscle helps support grafts on the aorta, big artery leading from the heart, and makes the grafts fit better when these are made from veins or from the sac that surrounds the heart.

Experiments showing good results with these supporting "corsets" were reported by Drs. Yoshio Sako and Richard L. Varco of the University of Minnesota Medical School.

The supporting corsets or jackets were made of tissue called fascia lata, which are the wide, dense sheaths of the thigh muscles.

War-Damaged Arteries

Better results are now being obtained in repairing arteries damaged by war wounds, a team of Army surgeons from Walter Reed Army Hospital, Washington, D. C., reported.

The wounds damaged blood vessels so that an abnormal connection, called a fistula, was formed between an artery and a vein. In some cases a false aneurysm formed, with the wall of the blood vessel ballooning out to form a sac filled with blood and then rupturing with the blood held by surrounding tissues.

In 144 Korean wounded, major blood vessels were involved in these wounds in 93 instances. In 27 patients, the damage was repaired by tying the cut ends and cutting out the sac of blood or the connection between the vein and artery. But almost a third of these patients, 29.6%, failed to get sufficient blood flow through the artery after the operation.

So the Army surgeons tried other techniques in subsequent cases, such as sewing the ends of the artery together and using artery and vein grafts.

LAUNCHING ROBOT PLANE—An AD-2 guide plane at the right of the photo is taking off from the deck of the USS Boxer. At a designated spot it will take control of the robot plane, the F-6-F shown on the left receiving a final instrument check. Equipped with special electronic gear and armed with a powerful warhead, the drone plane can be directed to its objective by the control plane which remains many miles away and high above the flack.

With these methods, the rate of poor results, that is, insufficient blood flow through the artery, was reduced to 6.06%.

Surgeons reporting these results were Brig. Gen. Sam F. Seeley, Lt. Col. Carl W. Hughes and Maj. Edward J. Jahnke, Jr.

Clearing Infected Wounds

An exception to the general opinion that almost any patient who can be moved can be transported by air appears in studies reported by Drs. William H. Harridge and Albert J. Novotny of the University of Illinois College of Medicine, Chicago. The exception, their mice experiments show, is the patient with peritonitis, dreaded complication of appendicitis when the appendix ruptures and infection spreads through the abdomen.

A new chemical for cleaning up infected wounds with promise of being especially effective in burns was reported by Drs. S. C. May, Sidney E. Ziffren and R. E. Kallio and A. D. Larson of the State University of Iowa College of Medicine, Iowa City.

It is an enzyme, called collagenase, from a protein-digesting microorganism called *Clostridium histolyticum*. The Iowa scientists developed this in a search for an enzyme that would dissolve muscle sheaths, tendons and skin, and thus be useful for cleansing wounds and burns involving such tissues.

Blame Germ Poisoning

Germ poisoning may put the fatal touch on patients in shock from hemorrhage so that they fail to rally even with blood transfusions. Studies showing this were reported by Lt. Russell M. Nelson and Howard E. Noyes of the Army Medical Service Graduate School, Washington, D. C., at the meeting.

The germs are those found in the intestines. But it is the poisons they produce, not the germs themselves, that cause the trouble.

Culturing the patient's blood to see whether there are germs in it, which is the customary procedure for detecting suspected infection, will not be adequate to measure the effects of bacterial organisms in such cases, Lt. Nelson pointed out.

The reason is that blood cultures give only an index to the presence of living bacterial cells, not to the products of the bacteria. The damaging consequences of infection in patients in hemorrhagic shock apparently are due to the bacterial toxins, or poisons, not the living organisms.

Normally the bacterial toxins are confined to the intestines. In shock from hemorrhage, however, the intestinal walls apparently become more permeable to bacterial toxins. The barriers that normally keep these from getting into the blood are damaged. The Army scientists' study supports this theory.

Their study was done by feeding botulinus toxin to dogs. Dogs are quite resistant to this poison. Blood samples from these dogs taken before and after hemorrhagic shock were then injected into mice. The death rate among mice injected with blood from dogs was more than double that of mice injected with blood from unshocked dogs. Among mice protected by botulism antitoxin, the death rate following injections of blood from dogs in shock was negligible. This showed that the toxin got into the blood in shock but did not when shock was not present.

Gelatin for Shock

For treatment of shock when blood or blood plasma is not available, there is a new modified fluid gelatin to join the rapidly growing group of plasma expanders. This gelatin, developed by Dr. Dee Tourtellotte and associates of the Knox Gelatin Company, has the advantage of remaining fluid at temperatures of 32 degrees to 40 degrees Fahrenheit.

Previous gelatins otherwise suitable for use as plasma expanders jelled, or hardened, at temperatures of about 50 to 55 degrees Fahrenheit, or at the even higher temperature of 80 degrees. Consequently, they could only be used when preheating was practical.

This new gelatin has been given to 92 surgical patients, after undergoing extensive tests in animals, by scientists at the University of Pennsylvania Schools of Medicine and the University's Hospital. In 22% of the patients studied, temperatures increased between one and 2.8 degrees Fahrenheit. One patient developed a chill for a few minutes, with rapid heart beat, but no subsequent fever.

Reactions such as skin rash, phlebitis and pulmonary edema (fluid on the chest) did not occur. The changes in temperature and blood pressure which did occur were felt to be due to the patient's illness, rather than to the gelatin.

Tests of liver function also showed no significant changes.

The findings show, the scientists report, that "fluid' gelatin can be administered easily and without any apparent ill effect."

The studies on patients were reported by Drs. John W. Thomas, Herndon B. Lehr and Jonathan E. Rhoads, and those on animals by Drs. William M. Parkins, Joseph H. Perlmutt and Harry M. Vars.

Science News Letter, October 4, 1952

MEDICINE

Gland Removal Relieves Cancer Pain Temporarily

➤ REMOVAL OF the adrenal glands has brought considerable improvement, including pain relief, but no cure, to 12 of 16 advanced cancer patients, Drs. Charles D. West, Vincent P. Hollander, Willet F. Whitmore, Jr., Henry T. Randall and Olaf F. Pearson of Sloan Kettering Institute, Memorial Hospital, New York, report to the American Cancer Society.

Pain came back in all cases, sometimes as soon as a week after the operation, and little change in cancer growth was noted.

Science News Letter, October 4, 1952

INVENTION

Patent Lead-Zirconium Bullets for Use as Tracers

➤ A NEW kind of bullet to replace the traditional tracer bullets has been invented by Peter P. Alexander, Beverly, Mass., and assigned to Metal Hydrides, Inc., also of Beverly. He has discovered that bullets made of an alloy of lead and zirconium burst into flame on impact with a target. Traditional tracer bullets, he says, give away the position of the rifleman. He received patent 2,611,316.

Science News Letter, October 4, 1952

SCIENCE NEWS LETTER

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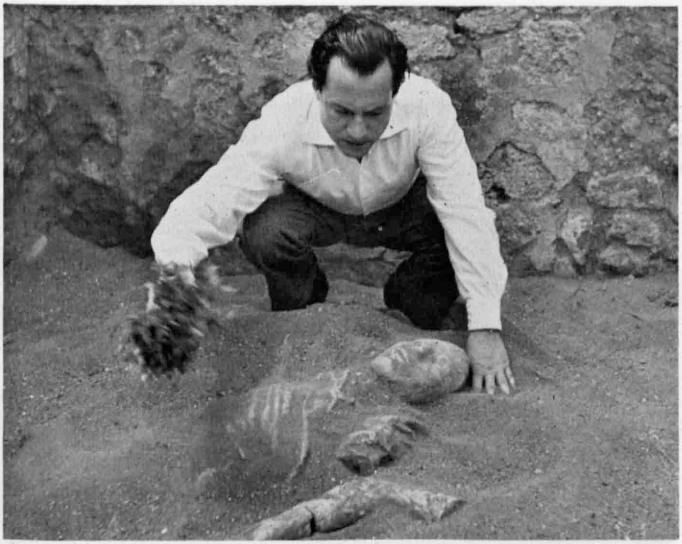

2,000-YEAR-OLD POMPEIIAN—Dr. Ettore Basevi sweeps away volcanic ash from the cast of a Pompeiian citizen trapped by an eruption of Mt. Vesuvius in 79 A.D. When a body is discovered, plaster is poured into the cavity formed in the volcanic ash by the corpse.

ARCHAEOLOGY

Dig in Ash-Buried City

➤ AN ARMY of over 1,000 archaeological workers has now resumed digging out the treasures of the famous buried city of the ancient Romans, Pompeii. One of the first goals will be the city's zoo where remains of cages, subterranean passages leading to the cages, and the bones of elephants, lions, bears and other wild animals have already been uncovered.

The Roman city of 25,000 inhabitants was suddenly buried under volcanic ash from a tremendous eruption of nearby Mt. Vesuvius in the year 79 A.D. Because of this abrupt burial, works of art and science as well as the articles of everyday life have been preserved without the ruin of slow destruction by the elements.

Even the features of the Pompeiian citizens have been kept intact, because the blanket of volcanic ash hardened with the rain to form a perfect cast of face and form immediately following death. Plaster poured into these molds produces a lifelike duplication of the individuals' appearance when living nearly 2,000 years ago.

The excavations are proceeding under the direction of Prof. Amedeo Maiuri, with funds provided by the Italian government. Complete excavation will take about five years, he estimates.

Over 60% of the volcanic overlay has been removed since excavations first began in 1748. Digging out has continued intermittently since then.

The Italian government's new policy is to leave the finds exactly as uncovered, or to put them on view in the Pompeiian museum on the grounds.

Science News Letter, October 4, 1952

TECHNOLOGY

Photographs Snapped as Plane Gun Starts Firing

➤ THE WORD of the pilot only of his success in hitting an enemy plane in combat need no longer be final. A new camera in his craft will automatically start taking pictures of the target as soon as the gun starts firing and continue to make pictures for a period after the shooting ceases.

First units of the new recording camera, developed by Bolsey Corporation of America, New York, have already been delivered to the U. S. Air Force. It is so fast that it can be synchronized to the firing mechanism of a 500-mile-an-hour jet combat plane. It operates up to 64 frames per second, is small in size, uses 16 millimeter film in 50-foot magazines, and can record sound if desired. Operation is so simple the crew need know nothing about photography.

Science News Letter, October 4, 1952

GENETICS

X-Ray Doses Do Not Harm Future Children

➤ LOW DOSES of X-rays given to women who are not pregnant, even if given directly to the ovaries, will not cause damage to subsequent children, in the opinion of Dr. I. C. Rubin of New York City.

In support of this, he cites, in a report to the *Journal of the American Medical Association* (Sept. 20), a case of a woman to whom he gave such treatment in 1923. The treatment was given to "stimulate" the ovaries in the hope of overcoming infertility. Treatment was successful and the patient, who had been married six years to one husband and eight to another without having a child, became the mother of a healthy boy. This boy grew up, married, and now the original patient is a grandmother.

The idea that low-dosage X-ray treatment to the ovaries can cause mutations in human offspring comes largely from experiments on *Drosophila*, Dr. Rubin points out. But the differences between these flies and women are too great, he thinks, for such conclusions.

Science News Letter, October 4, 1952

PHYSICS

Electronic Devices Control Air-Conditioning

➤ SENSITIVE ELECTRONIC systems to control the air-conditioning units in submarines are now being built into the Navy's newest class of undersea craft. Designed to replace present pneumatic systems, they are about four times as accurate.

Product of the Minneapolis-Honeywell Regulator Company, Minneapolis, Minn., they will automatically regulate the operation of the submarine's air-conditioning systems to control temperature, pressure and humidity in all spaces from torpedo rooms to control room.

The electronic control saves weight and space, and is easy to maintain. Disruption of electric power to one unit will not affect the others. With the pneumatic system, if the air pressure fails, the whole system breaks down, and the men in the submarine are left in a difficult situation.

Science News Letter, October 4, 1952

INVENTION

Now It Is a Bird in Plastic, Patented Cage

➤ NOTHING IS sacred. The old song about "only a bird in a gilded cage" must now be changed. Somebody has invented a plastic bird cage.

The inventor is Morris Yellin, Chicago, who assigned his patent, number 2,611,338, to Bernard Edward Co., Chicago. Mr. Yellin claims you can see more of the bird through the transparent plastic bars.

Science News Letter, October 4, 1952

GENERAL SCIENCE

Twelfth Talent Search

Scientific talents of high school seniors will be rewarded by entry in the Science Talent Search through which the leading scientists of the future are discovered.

➤ A SEARCH through the nation's high school senior classes for the 40 students with greatest promise as future scientists is now under way.

The Twelfth Annual Science Talent Search was launched with an invitation to seniors in 27,000 public, private and parochial schools throughout the land. They will have the opportunity to compete for $11,000 in Westinghouse Science Scholarships and a five-day visit to Washington.

Two hundred and sixty others will receive valuable honorable mention status. The results of the search will reveal who among this year's seniors will be the nation's leading scientists of the future, and will stimulate others to undertake scientific training.

The Science Talent Search is conducted by SCIENCE SERVICE and supported by the Westinghouse Educational Foundation. Watson Davis, director of SCIENCE SERVICE, in announcing this year's Search, called attention to the growing shortage of scientists and engineers, a shortage which may well hamper the nation's defense program.

"The Search is one method of seeking out scientific talent at an early age," Mr. Davis said. "It provides an incentive to youngsters for studying science. It stimulates teachers of science. The ever-growing complexities of our technological age demand an increasing number of scientists and engineers. The defense effort makes that demand more urgent."

Principals and science teachers in secondary schools throughout the country are now receiving instructions on "How to Search for Science Talent." They will learn how to recognize science talent among their students and encourage those boys and girls to enter the Twelfth Annual Science Talent Search.

They will send for, and after Nov. 15 receive, about 15,000 sets of entry materials so their qualifying seniors can enter the competition for $11,000 in scholarships. Thousands of seniors will comply with all requirements for entry right in their own schools.

From the 15,000 entries, it is estimated about 2,000 will complete all entry requirements. Of these, 40 will be named as national winners and will receive five-day, all-expenses-paid trips to Washington to attend the annual Science Talent Institute.

Another 260 will be named for honorable mention. All 300 will be recommended to colleges, universities and technical schools of their own choice. As in the past, it is expected all will receive offers of financial assistance for college educations from other sources on the basis of this honor.

For details, write to Science Clubs of America, 1719 N St., N.W., Washington 6.

Science News Letter, October 4, 1952

GENETICS

How Bloodhounds Track

➤ THE STUDY of hereditary differences in human body chemistry may one day produce results ranging from an explanation of how bloodhounds can accurately distinguish between human scents to providing clues for the use of genetics in medicine.

What is called biochemical genetics is the field of Prof. L. S. Penrose, London University geneticist, who led the discussion at the British Association for the Advance of Science meeting at Belfast.

The clue to the bloodhound's powers may lie in the discovery of definite abnormal substances in the sweat of people suffering from an hereditary chemical idiosyncracy called phenylketonuria. Prof. Penrose suggests we shall soon find sweats are as different and as characteristic as bloods and salivas. The bloodhound may depend on such individual differences in the chemicals in sweat for its unerring ability to distinguish between individuals' scents.

The study of inherited biochemical differences, which enable scientists to differentiate individuals by ordinary chemical tests, may make genetics into an exact science.

Human genetical inquiry attempts to reduce all characters as far as possible to chemical differences. This makes accurate scientific investigation possible, especially if the trait measured is found to be closely associated with the familial appearances of a single genic mechanism. The scientist can examine how the anomalous trait affects the constitution of the individual for good or ill. With the harmful traits, knowledge of the causal mechanisms can help in planning their alleviation and cure.

The study of human constitution becomes an exact science and is freed from ambiguities and superstitions which surround the cult of physical types.

Inborn hereditary chemical errors listed by Prof. Penrose include errors in: protein metabolism, of which albinoism is a common example; lipoid metabolism, including gargoylism in which there is a grotesque accumulation and distribution of fat in the body; carbohydrate metabolism, as found in diabetes mellitus, and a miscellaneous group including such examples as gout and red hair!

Some decades ago inborn chemical differences between people were regarded as unimportant curiosities, Prof. Penrose observes. Now they have been shown to be of quite general significance in the causation of natural variations in humans.

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ENGINEERING

Diesel Engines Properly Handled Usable in Mines

➤ DIESEL-POWERED EQUIPMENT can be used with safety in other than coal mines if properly equipped, adjusted and operated, the American Mining Congress meeting in Denver was told by J. H. East, Jr., of the U. S. Bureau of Mines.

Diesel power, lower in cost than most other kinds, is little used at present in underground work because of fear of its exhaust gases.

These exhaust gases present no hazard under proper conditions, it was indicated by Mr. East. Gasoline engines cannot be used with safety because their discharge gases may be up to 17% carbon monoxide. A gasoline engine operates on a "lean mixture" of gasoline and air, resulting in a high percentage of carbon monoxide in the exhausts.

The diesel engine, however, operates in an excess of air. Its exhaust should not contain more than 0.25% of carbon monoxide, nor more than 0.075% of oxides of nitrogen. This low percentage of toxic gases can be obtained if the diesel is adjusted to use more air in proportion to the fuel than is ordinarily used in surface equipment.

Science News Letter, October 4, 1952

METEOROLOGY

Forecast Weather to 80,000 Feet for Jets

➤ THE PROSPECTS are good for being able to forecast weather conditions from 50,000 to 80,000 feet up. This will be necessary, some day, when jet fighters and bombers now on the drawing boards go into operations.

The optimism about forecasting prospects at high levels was expressed by an Air Force weather scientist to a Washington, D. C., meeting of the American Meteorological Society. The scientist, Peter Wasco, found that both a vertical and a time continuity exist in weather systems at those levels. This means that weather at 50,000 feet has a relation to weather at 80,000 feet and that today's weather has some relation to what tomorrow will bring.

Science News Letter, October 4, 1952

ARCTIC CIRCLE BASE—At Thule, Greenland, 900 miles from the North Pole, personnel unload vehicles to be used in construction of the new large air base there.

PHYSICS

Cooling Homes in Summer

➤ HOMES WITHOUT summer cooling will be obsolete within a few decades, Dr. Maria Telkes, research associate of the Massachusetts Institute of Technology and authority in use of the sun's heat, has forecast.

Homes of the future will have push-button climate, eliminating dust, dirt and fire-hazards with less than half the fuel used today, she predicted. Since one-third of the fuel in the United States is now burned to keep us warm, it will be practical to have future control of indoor climate that will overcome sweltering heat as we have eliminated shivering cold.

Dr. Telkes' predictions for the future include: The "all-electric home" of the future will use electric power for cooking. An assortment of "electric-slaves" will be used for performing most household tasks. The entire house and its hot water supply will be heated electrically, using off-peak power available at low rates during the night.

The electric power will be stored as heat, using the latent heat of low-cost chemical compounds. This will result in an improved load factor, the electric power producers being able to operate at nearly full rate around the clock.

Keeping cool during the summer is the latest trend—with individual room coolers or with complete summer air conditioning. Predictions are that the manufacture of air conditioning equipment will increase at an explosive rate, the same way as television.

The homes of the future will be well insulated to prevent heat losses. During one heating season about $4.00 in fuel is dissipated through a conventional, single pane window. More than half of this could be saved by using two panes, such as storm windows or double windows.

The "perfect wall" of the future homes will transmit a great deal of sunshine during the winter, and will be an excellent heat insulator. Winter sunshine will be stored—in a chemical heat storage system operating on the principle of latent heat—and will decrease fuel costs. The summer heat will be eliminated, and the cool air during the night will operate a "cool-storage" system to supplement the air-conditioning cooling.

Forced air circulation, radiant heating, electric heating and solar heating will develop rapidly. The heat pump, operating with outdoor air warmed with solar energy, will become popular for maintaining the "comfort zone" summer and winter. Excess heating or cooling will be stored in a chemical storage system at low cost and small volume.

Science News Letter, October 4, 1952

GENERAL SCIENCE

U. S. Air Base at Thule, Greenland

➤ A HUGE air base, 900 miles from the North Pole, is nearly completed, the Defense Department has announced. The base, at Thule in Greenland, is designed to be a key point of several global air routes over the top of the world.

Two years under construction so far, the air base will be an important part of North America's defenses. From Thule, the air weather service network can be expanded and air-sea rescue operations in the Arctic will be easier.

Science News Letter, October 4, 1952

MEDICINE

Cortisone Saves Baby From Rh Blood Death

➤ CORTISONE, FAMOUS for its relief of painful, crippling arthritis, is credited by three Scottish physicians with helping save a baby from Rh blood death.

The case is reported by Drs. J. R. Anderson, G. M. Barr and A. Slessor of Glasgow in the *British Medical Journal* (Sept. 6).

The baby's mother was Rh negative, her husband Rh positive. Her first baby was a normal Rh positive boy. Her second became jaundiced within 20 minutes after he was born and, in spite of a transfusion of Rh negative blood, died within 32 hours.

During the last month of her third pregnancy, the mother was given cortisone every day. The baby, a girl, was normal at birth but became jaundiced after three hours. A replacement transfusion of Rh negative blood was given. The jaundice faded within the next week.

While the transfusion probably helped, the doctors think the cortisone deserves some of the credit and should be tried in other cases. Its effect presumably is due to its ability to prevent hypersensitivity reactions.

Science News Letter, October 4, 1952

NATURAL RESOURCES

Airborne Magnetometers Widely Used to Hunt Ore

➤ AIRBORNE MAGNETOMETERS, used during World War II to locate submerged enemy submarines, have become important in the hunt for hidden deposits of minerals to supply American needs.

Over a million square miles of territory have been surveyed by such instruments, the American Mining Congress meeting in Denver was told by F. W. Hinrichs of Fairchild Aerial Surveys, Inc., Los Angeles. The magnetometers are trailed behind and below airplanes that fly at low altitudes in parallel paths over the surveyed area. They detect magnetic minerals and signal recording instruments in the plane.

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SURGERY

Drive to Chain Smoke Possible Cancer Cause

➤ GLANDULAR ACTIVITY that drives men and women to chain smoke may be a factor in causing lung cancer, rather than the tobacco itself.

This new angle on the lung cancer-tobacco smoking question was suggested by Dr. Brian Blades, professor of surgery at George Washington University, Washington, at the meeting of the American College of Surgeons in New York.

"Frightening testimony against the cigarette" as a cause of lung cancer has been furnished by a number of doctors, Dr. Blades pointed out.

"There are, however," he said, "numerous authenticated cases of lung cancer in subjects who have never used tobacco in any form. One wonders if the endocrine drive which makes for chain smoking might be the explanation, rather than tobacco itself."

Lung cancer has increased steadily, he reported, in a decade during which millions of man hours and dollars have been expended for cancer research. It is the most common cancer of internal organs in men.

"The melancholy fact, however, is that the salvage rate in this huge group is shamefully low," he declared.

Science News Letter, October 4, 1952

PHYSICS

Solar Energy to Heat Texas Research Building

➤ WATER WARMED by the sun will be used to heat one of the new buildings of the Southwest Research Institute on Essor Ranch, San Antonio, Tex.

The solar energy apparatus is being installed both for research and for practical use. The equipment will include a heat-storage reservoir to overcome the deficiency of solar energy on occasional cloudy days.

The best known use of solar energy today is to produce moderately heated (150 degrees Fahrenheit) water. Although solar energy can be used to get higher temperatures, special equipment must be developed and maintained. Water heating requires only simple units with no moving parts.

By far the largest source of energy coming to the earth's surface is that from the sun. This energy, amounting to about one horsepower on each square yard of exposed surface, approximates the amount used by the average household.

Theoretically, appliances that operate from fractional-horsepower motors could be powered from a solar collector less than one-yard square. Such a collector could provide energy to operate a miniature household power plant.

Because the southwestern states are regions of low cloudiness, they offer the nation's best location for installing and operating equipment for solar energy utilization. Clear skies at these latitudes result in strong sunlight intensities that, in turn, minimize the size of required solar energy absorbers for a given application.

The relatively short cloudy periods permit the use of smaller storage facilities for reserve heat. These regional advantages tend to make the use of solar energy more competitive and worthy of serious consideration in the face of rising costs and the eventual depletion of coal, oil and gas.

Science News Letter, October 4, 1952

MEDICINE

Blood Albumin Safer Than Plasma or Serum

➤ ALBUMIN FROM human blood may be safer to give patients than transfusions of pooled blood plasma or serum, or even single donations of blood or plasma.

The greater safety lies in the much smaller, almost nonexistent, risk of the patient getting homologous serum jaundice from the albumin.

Studies showing this are reported by Drs. Richmond S. Paine and Charles A. Janeway of Harvard Medical School and the Children's Medical Center, Boston, in the *Journal of the American Medical Association* (Sept. 20).

Reason for the greater safety is apparently the heating for 10 hours at 140 degrees Fahrenheit that is normally carried out in preparing albumin. This seems to inactivate the virus that causes homologous serum jaundice and the underlying liver disease, serum hepatitis. The liver disease may occur without jaundice. This kind of jaundice and liver disease is not the same as the one doctors call infectious hepatitis. Infectious hepatitis usually comes in epidemics and is more like other so-called catching diseases.

Science News Letter, October 4, 1952

ENGINEERING

Roof-Bolting in Mines Saves Many Lives

➤ MANY LIVES in coal and metal mines have been saved during the past few years by the use of roof-bolts instead of supporting pillars to prevent roofs from falling, according to reports made to the American Mining Congress meeting in Denver. Ordinarily, in mining, roof-falls cause more deaths than all other types of mining accidents.

Roof-bolting is a relatively new method of preventing roof-falls. In the process metal rods several feet in length are driven into holes drilled into the roof where they fit in tightly. A head on the lower end of the rod helps hold the rock or earth of the roof in place.

Roof-bolting, both in coal and metal mines, ranks as the most important development in underground mining operations for the past five years, L. S. Chabot, Jr., Tennessee Coal and Iron Division of U. S. Steel Company, Fairfield, Ala., stated.

Science News Letter, October 4, 1952

IN SCIEN

ASTRONOMY

Glass from Space Found in Sahara

➤ PIECES OF glass from outer space have been picked up in the Western Sahara. They were found near a meteor crater known as Aoeulloul.

When analyzed at the British Museum of Natural History, the main composition of these strange glass objects, called "tektites," was found to be substantially different from that of the sand of the region.

With this report concerning their composition, Dr. W. Campbell Smith, keeper of minerals at the Museum, added new evidence in support of the extra-terrestrial origin of these rounded buttons of dark-colored glass. They arrived as glass meteorites. Scientists opposed to this theory believe that tektites, which have recently been found in the sands of Texas among other places, are merely desert sand melted by contact with a hot iron or stone meteorite.

Final proof of the existence of large glass meteorites must await actual observation of the landing of one here on earth. This may never occur, as some scientists believe the time when such meteorites fell has long since passed.

Science News Letter, October 4, 1952

MEDICINE

Third of Heart Trouble Not Organic

➤ MORE THAN a third of the patients who go to a doctor because of heart trouble symptoms have "functional heart disturbances," but no organic heart disease, Dr. Arthur M. Master of New York City found in a study of 1,000 consecutive patients.

Dr. Master, reporting in the *Journal of the American Medical Association* (Sept. 20), stresses that the word, disturbance, rather than disease should be used to avoid aggravating the mental and nervous strain of the patients.

Even though the hearts of such patients are organically sound, the pain, palpitations, premature beats and other symptoms may partly or totally disable the patients and disrupt their family or social life. The condition should therefore not be considered unimportant by the doctor, Dr. Master suggests.

Among the patients he studied, the ratio of men to women was three to one. Most were under 50 years. Treatment is "very often unsuccessful," Dr. Master says, urging research into the causes of these disturbances and for discovery of curative or preventive treatment.

Science News Letter, October 4, 1952

E FIELDS

PHYSICS

Shoot Radioactive Cobalt Through Pneumatic Tubes

➤ NOW SCIENTISTS are shooting radioactive cobalt from one room to another in a pneumatic tube transfer system like that used to carry cash in a department store.

The capsules containing the radioactive colbalt, however, are loaded into the pneumatic tubes by remote control. And they run in an S-shaped curve through a five-foot barrier of scrap iron, lead shot and barite aggregate.

This pneumatic tube transfer system is is one feature of the Navy's gamma ray generator at the Naval Medical Research Institute, National Naval Medical Center.

The generator is said to be the first of its kind anywhere. It was specially designed to give complete, uniform, total-body irradiation of target materials. It will be used for research on the effects of total-body radiation by gamma rays of a variety of target materials, similar to those exposed in atomic bomb tests.

Gamma rays, like X-rays, do not make the target material permanently radioactive. Before this generator was completed, existing gamma ray sources irradiated targets from at most a few directions, according to where the sources of the rays were placed.

The generator is housed in a specially constructed shielded building 47 by 30 by 12 feet. A T-shaped barrier divides the building into two exposure rooms and a control room.

Science News Letter, October 4, 1952

MEDICINE

Asthma Sufferers Should Not Smoke

➤ "NO PATIENT who has asthma should smoke."

So declare four Mayo Clinic physicians, Dr. Gustavus A. Peters, Louis E. Prickman, Giles A. Koelsche and Haddon M. Carryer in Rochester, Minn.

"Smoke of any type is irritating, not soothing, to mucous membranes," they declared.

Mucous membranes line the nose, throat and other parts of the breathing apparatus.

The Mayo doctors also object to so-called asthma cigarettes and burning powders containing stramonium or nitrates. Any "temporary" benefit patients get from these, they state, is offset by the harmful effect of the smoke itself, which aggravates the patient's bronchitis. All patients with asthma, they add, have some degree of bronchitis.

"No patient with asthma should irritate his inflamed membranes with smoke, any more than a patient with conjunctivitis (popularly known as pink eye) should blow smoke in his eye," the doctors state.

"Yet much high-pressure salesmanship is being exerted upon the public to encourage smoking.

"Although tobacco companies advertise how much less irritating their own brands of smoking tobacco are than some competitors' products, the fact remains that all types of smokes are irritating to mucous membranes," the doctors state.

Even if skin tests do not show that the patient has an allergy to tobacco products, this does not mean that the asthmatic patient can tolerate smoking.

The Mayo doctors also criticize indirectly fellow physicians who do not ban smoking for asthma patients, suggesting this may be because such physicians themselves are heavy smokers.

Science News Letter, October 4, 1952

OCEANOGRAPHY

Ice-Breaker Sails Within 508 Miles of North Pole

See Front Cover

➤ THE ICE-BREAKER, Eastwind, sailed within 508 miles of the North Pole this summer, the Coast Guard revealed in Washington. This is believed to be the farthest north point ever touched by a ship under its own power.

The heavy-duty cutter set this record on a return trip from Alert, the northernmost weather station in the world, located on the northeast tip of Ellesmere Island in the Canadian Northwest Territories on Dumbell Bay.

The Eastwind exceeded her own previous record, established in 1950, of sailing within 517 miles of the North Pole on a similar mission. Under the command of Capt. O. A. Peterson, U.S.C.G., the Eastwind met with Arctic ice up to 10 feet thick as it worked its way between and around floes having diameters up to 10 miles.

Shown on the cover of this week's SCIENCE NEWS LETTER is the Eastwind, silhouetted in an arch formed by one of the bergs.

Science News Letter, October 4, 1952

TECHNOLOGY

Rapid Method Tells Cotton's Maturity

➤ A NEW and "much more rapid" method of measuring the maturity and fineness of cotton fiber has been developed by the U. S. Department of Agriculture.

It consists of taking readings on untreated cotton and on cotton treated with the strong caustic, sodium hydroxide, and comparing the two mathematically.

The readings are taken on a Micronaire, an instrument now used for measuring fiber fineness. The method is named "Causticaire" because of the strong caustic used in the process. Rate of flow of air through the fiber indicates its fineness and maturity.

Science News Letter, October 4, 1952

MEDICINE

Cortisone Found Harmful Under Some Conditions

➤ UNDER CERTAIN conditions, the "wonder drug" cortisone may have harmful and even fatal effects, research at the University of California at Los Angeles School of Medicine and the Wadsworth Veterans Hospital has indicated.

This conclusion was reached after mice infected with coccidiodomycosis, a fungus disease known as "valley fever" in man, died faster after cortisone was administered.

Making the study were Drs. Victor Newcomer, Edwin T. Wright, J. E. Tarbet, Louis H. Winer and Thomas Sternberg.

A possible cause of the effect was explained as follows:

An excess of white blood cells seeking to pin down invading fungi resulted from the cortisone. The excess interfered with other body defense mechanisms which attempt to seal off the invaders. This breach of body defenses apparently allowed the fungi to spread.

Another unexpected finding was that the adverse cortisone effect did not parallel the increase in dosage. For a time, the death rate increased with dosage but suddenly dropped off at a certain level. Later, it rose again with further increases in dosage.

Further investigations are necessary along this line, the researchers emphasize, before the observations can be accepted as facts.

Science News Letter, October 4, 1952

SURGERY

Man Lives Over 3 Years With Colon for Gullet

➤ FOR THE past three and a half years a man in his 60's has been alive and eating a fairly normal diet, though all his food must be swallowed through an esophagus made partly from a piece of his colon, or large intestine.

Sulfa drugs and the antibiotic, Chloromycetin, are given credit for some of the success of the operation in a report by Drs. Charles W. Robertson, Chester W. Howe and Reginald H. Smithwick of Massachusetts Memorial Hospitals and Boston University School of Medicine at the meeting of the American College of Surgeons in New York.

These drugs were used to sterilize the piece of colon before it was cut and swung from its position in the lower abdomen to the top of the stomach.

The operation to replace part of the esophagus, or gullet, was necessary because cancer had attacked the upper part of the stomach and lower part of the esophagus.

Following the operation, the patient had a number of complications, each of which threatened his life. These were congestive heart failure, massive pulmonary embolism, and obstruction of the small bowel. He survived all of these through appropriate medical and surgical treatment.

Science News Letter, October 4, 1952

NATURAL RESOURCES

Uranium Needs Increasing

Hope for pitchblende in northwest Canada gives encouragement to atomic scientists who foresee the day when atomic energy will be vital in industries.

By A. C. MONAHAN

➤ FROM URANIUM City to Port Radium in northwest Canada is a 500-mile stretch of wilderness of little value in agriculture or forestry, because of its climate, but which some day may provide a plentiful supply of the basic metal needed in atomic energy. This is uranium.

It is already being produced in the Port Radium region and Geiger counters indicate radioactive materials far to the south.

Pitchblende, a primary uranium ore, was discovered near Great Bear Lake close to the Arctic Circle a little over 20 years ago, and Port Radium was established as a mining center. It is a modern village with dwellings that furnish comfort even in the 60-degree-below-zero weather and the almost 24-hour-daily darkness that prevail during the winter months. Silver, cobalt, copper and nickel are also mined in the same region.

Uranium City is in the building stage. A "boom" town in northwest Saskatchewan, just north of Lake Athabaska, it is the center of uranium prospecting activities and the place where mining claims are filed.

In the first day or two after the government filing office was opened on Aug. 4 of this year, some 500 claims were filed. It is estimated that 1,000 prospectors are surveying the area with Geiger counters. They include trained geologists, old-time prospectors, students and trappers.

Radium Originally Mined

Mining pitchblende at Port Radium in early days was to obtain radium, not uranium. The latter was discarded as waste. Pitchblende today, however, is the most important uranium mineral, far more important than the other 100 or so ores in which uranium is known to occur. Radium is a decay product of uranium. It was from pitchblende that Madame Marie Curie obtained the first known radium late in the 19th century.

Three deposits of pitchblende are now known. In addition to the Canadian reserves, there are deposits in the Belgian Congo and in Czechoslovakia. It was from the European source that Madame Curie obtained her pitchblende. These three sources have supplied most of the uranium used in the world, and all are in production. The Czechoslovakian mines are behind the Iron Curtain producing for the Soviet Union. Although it is unofficially reported that many thousands of men are engaged there in uranium mining, no one outside the Curtain knows the production totals.

Production figures for the Canadian and the Congo deposits are also secret, but it is known that these two sources together can not supply the needs of the free world. America and Britain are the principal users. Far greater quantities than those now mined will be required in the future when atomic energy is applied to submarines now being built and to airplanes. Further quantities will be needed as industrial applications develop.

Uranium Oxide Chemically

Pitchblende, chemically, is uranium oxide. It is found in vein deposits, frequently in association with the sulfide minerals of silver, nickel, iron, copper, zinc and bismuth. It is heavier than iron and about as hard as steel, and is grayish-black in color.

When ground to a powder, pitchblende is always black, greenish-black or grayish-black. Uraninite, another primary uranium mineral sometimes found in association with pitchblende, has similar properties and characteristics.

Carnotite is the principal source of uranium mined within the United States. It is found chiefly in the Colorado Plateau region, is yellow in color and usually occurs in soft or powdery earthy masses of sandstone. Often associated with it is a uranium mineral called tyuyamunite, which has similar properties. Both of these are classified as secondary uranium minerals. There are many others, but most of them are rare and difficult to separate from the ores in which they occur.

The mining and recovery of uranium, even from pitchblende, is a costly process, made profitable by government purchasing and by the recovery of metals with which the atomic energy metal is often associated.

In the Port Radium region of Canada, the pitchblende is associated with silver and minerals containing cobalt, nickel and copper. In the Congo country, cobalt, copper, nickel, gold, silver and platinum are found in association with the pitchblende. In Czechoslovakia, uranium recovery yields silver, nickel and cobalt.

Ores of uranium have been long used to impart color to glass. The element itself was discovered in 1789, but the part it was to play in future years was not even then dreamed of. In 1939, 150 years after its discovery, its atomic possibilities were recognized both in Europe and America. Work done in the subsequent decade proved that, by neutron bombardment, fission of uranium isotope of mass 235 was possible. Ordinary uranium is U-238 mixed

GAMMA RAY LOGGING UNIT—To aid in prospecting for radioactive minerals, including uranium, this jeep-mounted unit is equipped with a scintillation counting probe, more sensitive than a Geiger counter.

with very minute amounts of U-235. It is the U-235 that is important in atomic energy.

The search for uranium is going on, and will continue to go on. Latest reports are of supposedly important finds in Australia. But "hit-and-miss" methods of locating deposits in America are rapidly giving way to scientific search by geologists, who make use of the available vast store of geological information to determine what might be called probable areas.

This systematic search for uranium ores is under the direction of two federal agencies—the Atomic Energy Commission and the Geological Survey of the Department of the Interior.

Newest discovery of U. S. uranium is in the pumpkin Buttes area of the Powder River Basin in northeast Wyoming. Government scientists, following a long study of geological information of the area, made the discovery late last year. Surveys by airborne Geiger counters in government planes were followed by ground surveys in regions previously spotted by the airborne instruments.

Science News Letter, October 4, 1952

MEDICINE

Two Viruses for Infection

➤ A "RATHER BIZARRE" and hitherto unprecedented discovery that a virus-caused disease may require the simultaneous presence of two distinct viruses, each of which alone rarely produces disease or symptoms, is reported in *Lancet* by three British doctors from the National Institute for Medical Research.

The disease the doctors studied is a fatal liver infection (hepatitis) of mice. When they infected mice with the virus responsible for the disease and then treated the mice with the antibiotic, terramycin, the doctors found they were dealing not with a single virus, but with two viruses.

One of the viruses survived the terramycin and could be passed along from mouse to mouse by inoculation, but by itself failed to cause any disease in the mice. The only evidence of its presence was the fact that it protected the mice against subsequent challenge with fully infectious virus.

The second of the virus pair was discovered when the researchers injected mice with mouse-hepatitis virus diluted to the point where it could not cause disease, and subsequently found that mice so treated succumbed more quickly when challenged later with virus at infectious concentrations.

Putting two and two together — both theoretically and experimentally—the doctors then tried injecting their virus No. 1 into mice previously inoculated with virus No. 2, and discovered that when the two viruses thus came together in a mouse, the latter came down with hepatitis.

This novel discovery of a virus infection requiring the presence of two viruses, either of which alone is ordinarily harmless, may give scientists a new clue in their battle against virus diseases.

The three scientists who made the discovery are Drs. A. W. Gledhill, G. W. A. Dick and C. H. Andrewes. Dr. Andrewes is one of the world's foremost experts on virus diseases and one of the leading authorities on influenza.

Science News Letter, October 4, 1952

AGRICULTURE

Corncobs More Valuable

➤ CORNCOBS, UNTIL recently a drug on the agricultural market, are today increasing in commercial demand and value as a result of successful research by the U. S. Department of Agriculture.

Scientists and engineers of the Northern Regional Research Laboratory, Peoria, Ill., have developed new methods and new markets for ground corncobs, according to Dr. G. E. Hilbert, chief of the Bureau of Agricultural and Industrial Chemistry. The result has been an expansion of the industry from one plant in 1939 to more than two dozen today. An increase in tonnage of cobs processed, from 5,000 tons in 1939 to 600,000 tons this year, has been predicted by Dr. Hilbert.

The largest industrial use for corncobs is in making furfural. Two-thirds of the cobs used in 1952 will be consumed in the preparation of this oily, straw-colored liquid, valuable in defense and other industries for the refining of vegetable and petroleum oils, and the production of synthetic rubber, nylon, synthetic resins and medicinals.

Processing of corncobs was stimulated during World War II by the demand for furfural for synthetic rubber, the demand for materials to burnish and polish cartridge cases, and the need for soft grits for cleaning airplane engines.

The metal stamping and electroplating industries are the next largest consumers of cob products, which many find superior to the hardwood sawdust previously used in those fields. Ground cobs satisfactorily remove rough spots and dirt, polish metal stampings, absorb residual plating solutions from electroplated parts and polish them.

Soft grits from corncobs used in an air blast method have proved the most inexpensive, efficient and safest material for cleaning airplane and automobile engines and parts, precision apparatus, and large electric motors and generators. Cob grits are also used in removing "flash," the rough edge left after molding, from molded plastics, metal die castings and similar items.

Gardeners and nurserymen have found ground cobs satisfactory as a mulch for roses, carnations, strawberries, cucumbers, trees and shrubs. Cobs can be combined with blackstrap molasses and other nutrients to make an economical feed for beef cattle. Cob meal is rapidly replacing corn meal as a mild abrasive in hand soaps, and fine cob flour is being used in the production of insecticides.

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The *chameleon* has an insect-catching tongue twice as long as its body.

Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. books in print, send a remittance to cover retail price (postage will be paid in U. S.) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

THE ANTHROPOLOGY OF IRAQ: Part II, Number 2 Kurdistan and Part II, Number 3 Conclusions—Henry Field—*Peabody Museum*, 141 p., illus., paper, $6.85. One of the main objectives of the Field Museum Anthropological Expedition to the Near East was to obtain the physical measurements of the Kurds of northeastern Iraq reported here. Many photographs are included.

BIOLOGY AND LANGUAGE: An introduction to the Methodology of the Biological Sciences Including Medicine—J. H. Woodger—*Cambridge University Press*, 364 p., $8.00. A discussion of the language of biology with suggestions for clarifying obscurities and sources of controversy.

CLASSIFICATION OF THE ORTHEZIIDAE: Supplement to Classification of Scale Insects of the Subfamily Ortheziinae — Harold Morrison—*Govt. Printing Office*, USDA Technical Bulletin No. 1052, 80 p., illus., paper, 30 cents.

CONVERSATION AND COMMUNICATION: A Psychological Inquiry Into Language and Human Relations—Joost A. M. Meerloo—*International Universities Press*, 245 p., $4.00. Conversation, says the author, is loving each other. Even angry words help to dissipate the anger and bring people closer to one another. But sometimes conversation can be paralyzed by "Verbocracy" and the numbing influence of dogmatism.

FLEAS, FLUKES AND CUCKOOS: A Study of Bird Parasites—Miriam Rothschild and Theresa Clay — *Philosophical Library*, 304 p., illus., $8.75. A book for naturalists and amateur nature lovers about odd and interesting cases of communal life and parasitism.

HONEYBEE—Mary Adrian — *Holiday House*, 51 p., illus., $2.00. A charming book for children describing clearly the complicated life cycle and social organization of the bee.

HOW TO WRITE A BOOK—Cecil Hunt—*Philosophical Library*, 150 p., $3.00. A book of practical suggestions on the mechanics of book writing by the former literary editor of the "Daily Mail."

LABORATORY EXPERIMENTS IN COLLEGE CHEMISTRY—V. R. Damerell—*Macmillan*, 124 p., illus., paper, $1.75.

LABORATORY MANUAL FOR INTRODUCTORY CHEMISTRY—Lillian Hoagland Meyer—*Macmillan*, 114 p., illus., paper, $1.75.

LITTLE SHIP ASTRO-NAVIGATION—M. J. Rantzen—*Philosophical Library*, 159 p., illus., $4.75. A book for yachtsmen to show them that celestial navigation is not solely for natural-born mathematicians.

MARCO POLO — Manuel Komroff — *Messner*, 171 p., illus., $2.75. A young people's biography of the famous voyager.

MATHEMATICAL MODELS—H. Martyn Cundy and A. P. Rollett—*Oxford University Press*, 240 p., illus., $5.50. Prepared with the idea of showing that even in mathematics one can have fun and to provide tangible objects that will bring contact with reality into its symbolic world. You will enjoy twisting strings, folding paper, and cutting and pasting to make the models.

MODERN PLASTICS ENCYCLOPEDIA AND ENGINEER'S HANDBOOK 1952—Hiram McCann, Ed.—*Plastics Catalogue Corporation*, 848 p., illus., $2.00. Technical articles and all sorts of useful information about modern plastics and their manufacturers.

NEUTRON CROSS SECTIONS—Advisory Group, D. J. Hughes, Chairman—*Office of Technical Services*, 14 p., with large quantity of graphs, paper, $1.00. Presenting the "best values" for the cross sections together with an estimate of error where practicable. Most have been measured several times, sometimes by different methods.

PHARMACEUTICAL CALCULATIONS — Willis T. Bradley, Carroll B. Gustafson and Mitchell J. Stoklosa—*Lea & Febiger*, 2d ed., 290 p., $3.75. A practical book on just the mathematical processes the pharmacist will need in his work.

QUINTUS VERANIUS, CONSUL A.D. 49: A Study Based Upon His Recently Identified Sepulchral Inscription—Arthur E. Gordon—*University of California Press*, 341 p., illus., paper, $1.75. A Roman governor died in Britain, and this is what can be learned about him from a slab on a garden wall in Rome.

RESEARCH AND DEVELOPMENT IN THE UNITED STATES AIR FORCE—*Air Research and Development Command*, 32 p., illus., paper, free upon request to Commanding General, Headquarters, ARDC, Post Office Box 1395, Baltimore 3, Md. Information for contractors on the mission of ARDC and, roughly, what is going on at the various centers together with details on how to get contracts for research.

REVIEW OF ELECTRONIC DIGITAL COMPUTERS: Papers and Discussions Presented at the Joint AIEE-IRE Computer Conference, Philadelphia, Pa., December 10-12, 1951—J. C. McPherson, Chairman — *American Institute of Electrical Engineers*, 114 p., illus., paper, $3.50. Contains descriptions of ten large-scale computers of varying design, giving a cross-section of the different types now in use.

SCIENCE EXPERIENCES: Elementary School—Bertha Morris Parker—*Row, Peterson and Company*, 272 p., illus., $3.00. Intended as a text for elementary school science classes, this book gives directions for simple and interesting experiments.

THE SCIENTISTS LOOK AT OUR WORLD—John M. Fogg, Jr., Ed.—*University of Pennsylvania Press*, 147 p., $3.00. In these Benjamin Franklin Lectures, five scientists reported on recent advances in their own fields of specialization.

TANNIN FROM WASTE BARK — *Northeastern Wood Utilization Council*, 31 p., paper, $2.50. Figure for the potential tannin production in the United States reaches 221,844 tons.

UHF PRACTICES AND PRINCIPLES—Allan Lytel—*Rider*, 390 p., illus., $6.60. A book for students and technicians on this new type of transmission which is coming into wider use.

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TECHNOLOGY

Glass Tile Ceilings Give Quiet, Insulation

➤ GLASS CEILINGS for dwelling houses are predicted for the future. A test house in Perrysburg, Ohio, seems to prove that glass ceilings give a quietness not obtained with familiar materials, and at the same time give better insulation against heat transmission.

Ordinary glass is not used. These ceilings are of glass tile made of glass fiber. They are not transparent as window glass would be, and they are not reflective as a glass mirror is. They do have, however, high light reflective value, an added advantage, and they are fire-resistant.

The glass fiber employer is a product of Owens-Corning Fiberglas Corporation, Toledo, and some 1,100 square feet of textured tile is used. In the two bathrooms and the kitchen, a material known as Fiberglas Sonofaced tile is employed. This tile has a plastic film surface that withstands greasy smoke and steam.

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PHYSICS

Six New Compounds Are Superconductors

➤ DISCOVERY OF six new compounds that are superconductors has been reported by two scientists who worked at the University of Chicago.

Superconductors show an abnormally high electrical conductivity when cooled down near the lowest temperature believed possible, about 459 degrees below zero Fahrenheit. Dr. B. T. Matthias now of Bell Telephone Laboratories, Murray Hill, N. J., and Dr. J. K. Hulm of the University's Institute for the Study of Metals report in *Physical Review* (Sept. 1) that they tested about 90 compounds to find the six new superconductors. Of the six, two are nitrides, two are borides and two are alloys of metals.

Science News Letter, October 4, 1952

PSYCHOLOGY

Let Handicapped Help

➤ HANDICAPPED PERSONS should be taught to help others as well as themselves. They should particularly learn how to help the people on whom they depend.

This new twist in rehabilitation was stressed by Dr. Morton Hoberman and Erbert F. Cicenia of the New York State Rehabilitation Hospital, West Haverstraw, N. Y., in a report to the American Congress of Physical Medicine meeting in New York.

Emphasis in the past, they said, has been on total rehabilitation of such patients. Hospital staffs attempt to train disabled patients to care entirely for themselves, without acknowledging that many of them will always be dependent on other persons for assistance in performing many simple daily tasks.

Such patients, they urged, should be trained to assist those who care for them. In addition, parents and others who attend severely disabled persons at home should be given training too.

The training need not be complicated. The patient could be taught ways to assist an attendant in helping him in and out of a wheelchair, to help himself be lifted from wheelchair to bathtub or car, to assist in dressing, and similar other tasks. In turn, the parent or attendant could be taught ways of helping the disabled patient perform these tasks with a minimum of effort on both parts.

Such training, the doctors said, would not only reduce the time and effort needed in home care of disabled patients, but would prove a psychological boon to both patient and attendant.

Many parents and families are overwhelmed when confronted with the task of caring for a disabled patient, they said.

Following the epidemic of poliomyelitis in 1949, the New York State Rehabilitation Hospital was filled with many disabled patients, and Dr. Hoberman first realized how reluctant many parents, husbands and wives were to take their handicapped relatives home. One set of parents flatly refused to take their handicapped son, declaring that the physical problems involved in his care were too much for them to handle. Upon investigation, doctors discovered that while the hospital had spent six months in teaching the patient to use a wheelchair, they had completely overlooked any need for teaching him how to help others care for him.

Science News Letter, October 4, 1952

PUBLIC HEALTH

Check Health of Adults

➤ NOW THAT the children are off to school after a careful health check, it might be a good time to check the health of the grown-up members of the family.

Maybe dad and mother are beginning to put on too much weight and should see the family doctor about a diet to fight off Old Man Obesity. Check with the dentist to see whether gums as well as teeth are in good condition. Freedom from toothache may be misleading. Teeth decay less rapidly at older ages, but that is when gum diseases may take over.

Those in the family who have passed their 40th birthday should also have their eyes checked. If they cannot see fine print and are having trouble with telephone books, the evening newspaper or threading needles, it may be that presbyopia is developing. This is the medical name for the farsightedness which comes in middle age. This is a normal condition, even if a nuisance, and a pair of reading glasses will restore normal eyesight.

There are, however, other eye conditions that occur after age 40 which are far more serious. For example, cataract, uveitis and glaucoma.

These diseases are major causes of blindness among adults. Cataract robs sight by clouding the lens of the eye so that insufficient light is able to fall on the sensitive retina. Uveitis is an inflammation of some layers of the eye and may be either acute or chronic. Glaucoma is caused by an increase of fluid pressure within the eyeball. This increased pressure gradually destroys vital parts of the eye, such as the optic nerve and retina, and blindness results.

"These diseases often develop slowly," says Dr. Franklin M. Foote of the National Society for the Prevention of Blindness. "Many of the 800,000 Americans now going blind from glaucoma actually don't know they have the disease. And while victims of cataract can often regain their sight through surgery, the best that can be done for glaucoma is to prevent further loss of sight."

The only effective means of preventing loss of vision through glaucoma is by early treatment, Dr. Foote reports. That's why the National Society is stressing the need for periodic eye examinations after 40; if glaucoma is detected at an early stage, drugs or surgery can usually check its progress. The outlook in uveitis also is best when there is early diagnosis.

Science News Letter, October 4, 1952

PHYSICS

Device May Permit Mass Fluorography

➤ MASS FLUOROGRAPHY of the head and abdomen to detect disease, including, perhaps, stomach cancer, is the promise of an X-ray device reported by Dr. Paul C. Hodges of the University of Chicago at the meeting of the American Roentgen Ray Society in Houston.

The new device uses the light-gathering characteristics of the Schmidt astronomical camera to make fluoroscopic pictures of dense areas of the body with one-sixth the doses of X-rays heretofore used for this purpose. The resultant saving in time, money and exposure to X-rays is what may make this device suitable for mass disease detection.

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MEDICINE

Glycerine Keeps Red Blood

➤ HUMAN RED blood cells can be kept frozen in a 15% glycerine solution for periods of six months and still show the same ability as fresh cells to survive in the body after transfusion.

This has just been reported in *Lancet* by an Anglo-American team of doctors working at the National Institute for Medical Research in London.

The doctors kept their red cells frozen at either five degrees above or 110 degrees below zero Fahrenheit for six months at a time, thawed them, removed the glycerine and then transfused them, together with fresh cells of a different blood group, into anemia patients whose own cells were of yet different blood groups to either of the transfused cells.

It was by this difference in the blood group types of the various cells that the doctors were able to identify them and count them at several time intervals after the transfusion. In this way, the doctors were able to note what percentage of the frozen cells and of the fresh cells survived at each interval.

They found that the cells stored at both low temperatures were capable of normal survival in the body after transfusion equal to that of the fresh cells. However, the cells kept at the colder temperature survived the storage period two to three times better than those at the higher, so the former was the more desirable method of storage.

The doctors point out that two obstacles must be overcome "before storage of red cells in the frozen state can be of practical value in the field of blood transfusion." These are the present complexity of the method of removing the glycerine in which the cells are frozen and the high destruction rate of the cells during storage.

There is already promise that both these obstacles are being overcome.

The doctors cooperating in this research are P. L. Mollison of England and H. A. Sloviter, American Cancer Society fellow, and H. Chaplin, U. S. Public Health Service research fellow.

Science News Letter, October 4, 1952

ORNITHOLOGY

Rare Trumpeter Swan Shows Population Gain

➤ THE RARE trumpeter swan, once threatened with extinction in this country, now shows a United States population of 571 birds, Albert M. Day, director of the Department of Interior's Fish and Wildlife Service, reports.

A census by Fish and Wildlife Service and National Park Service personnel has revealed an increase of 36 trumpeters over last year's count of 535. All United States areas where this graceful snow-white creature with the melodious call is known to exist were covered in the census.

In nearly all cases, the birds were found on or near Federal sanctuaries, the creation of which began in 1935 when the number of swans hit a precarious low of 73 birds and special conservation areas were seen to be called for.

Abundant in this country during the last century, the swan's numbers dwindled to such an extent that the bird became known as one of America's vanishing species. Since the average trumpeter weighs 30 pounds, has a wingspread of 8 feet, and flies close to the ground, the bird had made an easy target for gunners.

Heavy trading in the bird's down and breast skin had thinned the trumpeter ranks. Destruction of the swan's breeding grounds by farm and ranch interests added to the trumpeter's depletion. In the early 1900's the species was believed actually to be extinct.

This year's census, as in previous years, was conducted at the conclusion of the breeding season in order that all newcomers to the trumpeter ranks might be included in the count.

Science News Letter, October 4, 1952

More than 15,000,000 pounds of *poultry* were canned in July.

Questions

AGRICULTURE—To what uses are corncobs now being put? p. 219.

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MEDICINE—How can cancer pain be temporarily relieved? p. 212.

What percentage of patients with heart trouble symptoms have nothing organically wrong? p. 216.

Why should asthma sufferers not smoke? p. 217.

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NATURAL RESOURCES — Where is the most recently discovered U. S. uranium deposit? p. 218.

• • •

OCEANOGRAPHY—What is the closest to the North Pole a ship has been reported as sailing under its own power? p. 217.

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PSYCHOLOGY — Why should handicapped persons be taught to help others as well as themselves? p. 221.

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TECHNOLOGY—How can the pilot's word on enemy plane damage now be confirmed? p. 213.

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Photographs: Cover, U. S. Coast Guard; pp. 211 and 223, U. S. Navy; p. 213, Hamilton Wright; p. 215, U. S. Army; p. 218, Bogue Electric Co.

Do You Know?

Alarm *clock* works are made largely of brass.

Great wave-like *movements* have been detected in Wisconsin's Lake Mendota even though the surface is calm.

Animal *experimentation* is essential to modern medicine since an understanding of life can come only through observing living things.

The Central American *basilisk* is a lizard that habitually runs on its hind legs after it gets up speed; it can even dash over the surface of a pond or stream, kicking up a V-shaped spray as it goes.

RADIOLOGICAL DEFENSE LABORATORY—The Navy's new laboratory for research on defense against atomic weapons, a six-story, windowless structure now being built in San Francisco, will look like this when completed.

ENGINEERING

Tire Squeal Unreliable

➤ SQUEALING TIRES do not necessarily mean that your car is about to skid on a curve. More often the squeal merely is a product of the tire's design and the pavement it is running on.

But experts do advise motorists to consider squeal as a warning that the pavement is slippery when wet. Drivers should remember that warning on rainy days.

In a survey made in Washington, Joseph Barnett of the U. S. Bureau of Public Roads pointed out that most of the first low-pressure tires squealed louder on curves than regular high-pressure tires did at the same speeds. Therefore the loudness of tire squeal cannot be used to tell how "near" a skid is.

On some roads, cars sometimes skid with no tire squeal at all. At other times, tires cry harshly at city street intersections when the car is turning slowly.

Ralph A. Moyer, research engineer at the University of California, said his studies reveal that tires squeal a lot on dry glazed asphalt surfaces, polished concrete and other smooth surfaces. Streetcar tracks also make tires cry.

Friction between the tire and these surfaces is much lower than it is between the tire and rougher kinds of pavement. As a result, he said, the tire slips very slightly as curves are turned. As curve-taking speeds increase, the rubber finally squirms enough to be heard.

Factors affecting tire noise are inflation pressure, road temperature, wheel rim width, softness of tire-tread compound, curvature of the tread, load carried by the tire, and the type and condition of the road surfaces.

"Exceedingly small changes in any of the factors may make the difference between squeal and no squeal," said R. D. Evans of the Goodyear Tire and Rubber Company.

Technical details of tire squeal were published in Bulletin 51 of the Highway Research Board. (See SNL, Sept. 20, p. 189.)

Science News Letter, October 4, 1952

More civilians have limb *amputations* than military personnel, even during a war.

AGRICULTURE

Grow Seedless Tomatoes In Weedless Gardens

➤ SEEDLESS TOMATOES have been grown in weedless gardens, using a chemically changed form of the weed killer, 2,4-D, Department of Agriculture chemists have reported.

The modified weed-killing compound also causes the fruit to grow larger and the quality is excellent, Dr. G. E. Hilbert, chief of the U. S. Department of Agriculture's Bureau of Agricultural and Industrial Chemistry, said.

Ordinary 2,4-D harms tomato plants, sometimes even killing them. By combining the 2,4-D with certain amino acids, those known as l-amino acids, the chemists made the compounds that helped the tomato plants. They tested the weed killer combined with the l-form of 12 of the 22 or 23 known amino acids, and got the beneficial results each time.

All tests, however, Dr. Hilbert warned, have been made under controlled greenhouse conditions, and field tests are necessary before the results can be applied commercially.

Drs. J. W. Wood and T. D. Fontaine, chemists, and Drs. J. W. Mitchell and Paul Marth, plant physiologists, all of the Bureau, conducted the studies with the modified 2,4-D.

Science News Letter, October 4, 1952

The average *rocket* missile is about 20 times less accurate than a gun-fired projectile; small errors in aim are magnified by the rocket's slow starting speed.

New Machines and Gadgets

For addresses where you can get more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., Washington 6, D. C., and ask for Gadget Bulletin 642. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

HAND SPONGE with an attached handle is designed so that housewives will not have to put their hands into water and strong cleansing solutions when washing tubs, sinks, windows, automobiles or furniture. Available in red or yellow, the handle is bonded permanently to the rectangular cellulose sponge.

Science News Letter, October 4, 1952

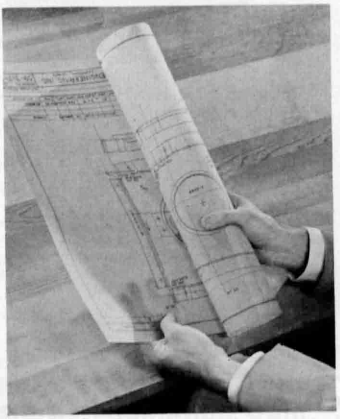
REFRIGERATOR ENAMEL that has a low-luster, porcelain-like finish now permits housewives to add a dash of color to white refrigerators, sinks, bath tubs and wash basins. The enamel is a quick-drying white that can be tinted with standard oil colors and applied with a spray-gun or brush.

Science News Letter, October 4, 1952

WEATHER STRIPPING that seals loose-fitting doors and windows against wintry blasts and blowing rains is easily tacked into place. Made of a sponge rubber, the weather stripping is coated with neoprene which adds resistance to abrasion, temperature extremes, moisture and sunlight.

Science News Letter, October 4, 1952

DRAWING MATERIAL for draftsmen is a non-shrinking vinyl plastic sheeting, shown in the photograph, that resists wrinkling and fraying at the edges. Grid lines,



borders and an information box are printed in reverse on the back-side of the "paper" for the draftsman's convenience. The translucent material can be run through duplicating machines in the same manner as regular tracing cloth.

Science News Letter, October 4, 1952

BELT KIT, complete with two kinds of buckles, provides the raw materials for a home-made belt covered with the wearer's own dress material. The belt can be laundered or dry-cleaned.

Science News Letter, October 4, 1952

SOLDERING IRON that uses a chemical cartridge for its heat source, instead of electric power, heats in 10 seconds to 800 degrees Fahrenheit and maintains that temperature for seven minutes. Five interchangeable tips ranging from ⅜ inch to one inch in size are available.

Science News Letter, October 4, 1952

COPY MACHINE for offices and drafting rooms makes ready-to-use duplicates from any type of original copy, even from copy that is opaque. Duplicates are printed on a special paper sensitive to the actinic light of mercury arc lamps. The paper is processed automatically inside the machine in a matter of seconds.

Science News Letter, October 4, 1952

WATER-TIGHT COATING for caskets is sprayed on and dries quickly to form a tough web, completely enclosing steel or wooden caskets and sealing tiny cracks. Made of vinyl resin, the coating resists natural chemicals in the soil. Pigments can be added for metallic silver- and bronze-looking coatings.

Science News Letter, October 4, 1952

Nature Ramblings

➤ AUTUMN IS the time for pruning, which is all the surgery most trees should need.

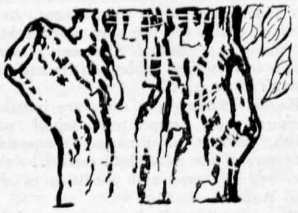
Indeed, if you have the care of a tree from its youth onward, simple pruning is all the care it will require to prevent the disastrous heart-rot that would later necessitate a visit from the expensive tree surgeon with his chisels and concrete fillings.

The fungi and other micro-organisms that cause this rot invariably invade the tree through some untended wound where a branch has been broken or improperly cut off, leaving a naked stub open to their insidious attack.

The right way to cut a branch off a tree is to set your saw just as close to the line where it joins the trunk as possible. But don't saw straight downward, parallel with the trunk. That will leave too large a wound, which will take too many years for the bark-growth to heal.

Cut outward at a very slight angle, so as to go as squarely as possible across the diameter of the branch itself. That will

Time for Pruning



leave a slight hump, but not unsightly, and in a few years the bark will have grown completely over it and no one will notice it at all. The right way to prune is shown on the right, in the sketch.

The way a branch should never be sawed off is shown on the left. It takes a very long time for the bark to shove its edges over the end of a stub like this. Frequently the bark will die back to the trunk instead, leaving the rotting stub as a sure highway for invasion by rot fungi.

While you are making your cut, be very careful to support the branch, lest its weight break it off before you have finished, thereby tearing a long strip of bark and perhaps a splinter-gash into the wood itself. Wounds of this kind are nasty, again invitations to fungi, and in any case unsightly until they have healed. If your branch is a large one, better undercut it a few inches out before starting your main cut. Then if it does break off it will do no harm.

After you have your branch cleanly cut off, brush away any sawdust and bits of bark that may be clinging to the face of the cut and paint it immediately. A little later give it a second, and even a third coat. This is the best way to keep out decay organisms. Ordinary house paint is good enough, but best of all is a good, flexible, weather-resistant asphalt paint.

Science News Letter, October 4, 1952