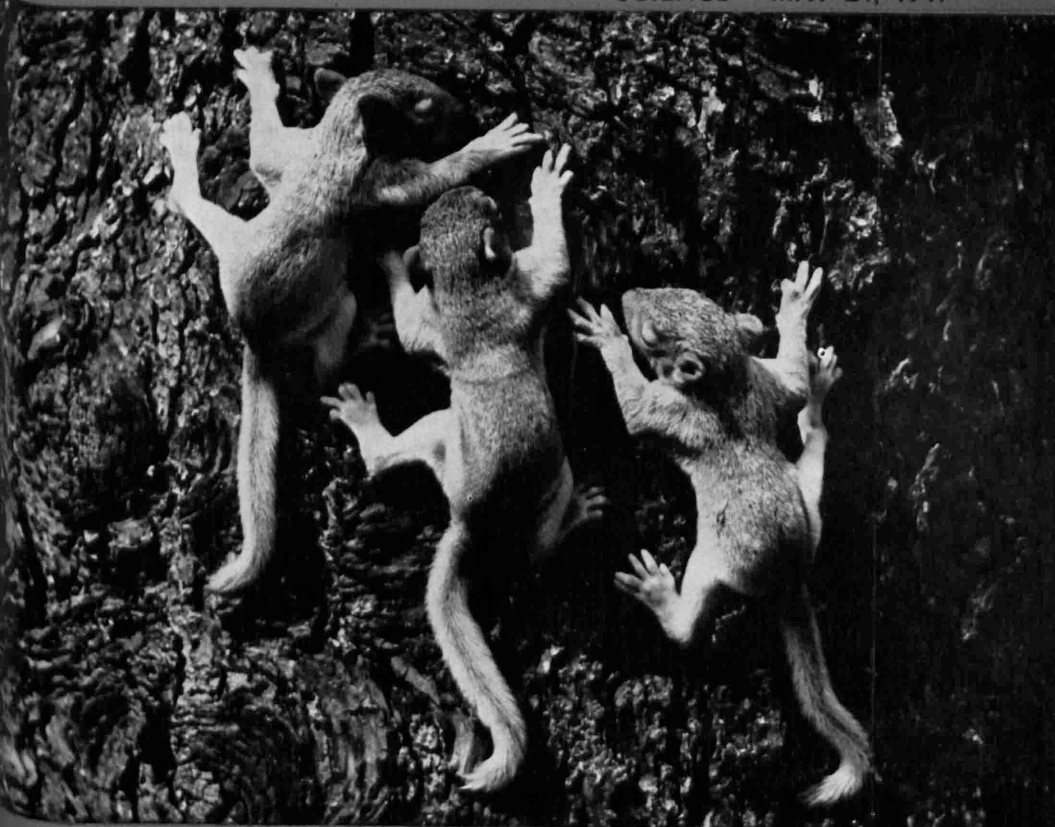


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SCIENCE NEWS LETTER

Vol. 31, No. 21

THE WEEKLY SUMMARY OF CURRENT SCIENCE • MAY 24, 1947



Spring Babies

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A SCIENCE SERVICE PUBLICATION

ENGINEERING

Oil Produced from Shale

To assure the U. S. of an ample supply of liquid fuels, the government has opened a plant for the production of gasoline from oil shale.

► SOME 92 billion barrels of oil bedded within America's oil shales will soon begin to take its place in the nation's liquid fuel supply.

A dribble of 1,200 to 2,000 gallons a day will be obtained from the government's new \$2,000,000 demonstration plant near Rifle, Colo. This first commercial production in the United States is intended to show what can be done.

Gasoline from oil shales has been produced for several years in various countries. Production from this source has been delayed in America because natural petroleum was plentiful. This plant is one step in the government's program to assure America a plentiful supply of liquid fuels even if natural petroleum deposits are exhausted. Other steps include the production of oil from coal and lignite, and alcohol fuels from farm products, particularly farm wastes.

This government demonstration plant, which is in part experimental, is located on the U. S. Naval oil-shale reserve in a region in which more than half the nation's entire oil shale is found. About 15 gallons per ton of shale is expected. It is estimated that there are 300,000,000 barrels per square mile.

The extraction of oil from oil shale is a relatively simple process. It is costly, however, because the shale must be mined, carted to the plant and crushed before processing. It is put into giant retorts lined with fire-brick where it is heated enough to drive the oil off

in vapor form. This vapor is collected, condensed, and then refined much as natural petroleum is processed. Waxes and lubricants are obtained as well as the fuel.

Most oil shales are hard, slate-like rocks with greenish-brown veins of greasy material. Mining at Rifle is relatively easy because much of the shale crops out on mountain slopes, and the mining shafts can be driven horizontally into the mountain sides. In other sections of the country much of the shale is underground and must be brought to the surface by shaft elevators.

In Sweden, oil is being obtained from underground shale by heating the material where found by means of electricity. Electric heaters are lowered into the shale beds through bored holes and, after months of heating, the vapors arise through these and others. The process is reported successful, but it seems to be practical only where electrical energy can be obtained without fuel-consumption, as by waterpower.

In addition to Colorado's oil-shales, there are deposits in Utah, California, Kentucky and Indiana. California's shales yield a true petroleum that can be dissolved out with solvents of the naphtha type. They yield about 20 gallons to the ton. Kentucky-Indiana deposits are underground but near enough to the surface to be recovered by strip-mining. Tests indicate they will yield about 16 gallons per ton of rock.

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CHEMISTRY

Using Wasted Iron Oxide

► THOUSANDS of tons of valuable iron oxide are wasted each year from steel mills and titanium oxide plants, the American Institute of Chemical Engineers was told by C. C. DeWitt of the Michigan State College. It is dumped into streams where it pollutes the water.

This present waste product is what is called pickle-liquor, an acid solution used to clear the metal of scales and other unwanted impurities. The waste

liquor contains a salt of iron in combination with sulfur and oxygen, in what chemists call ferrous sulfate. From this solution, iron oxide can be obtained.

For many years a certain amount of this iron salt solution has been converted to copperas, which is the solidified ferrous sulfate, by evaporation and crystallization. From the copperas, iron oxide paint and polishing rouge are made. There are many additional uses,

however, for which the recovered oxide can be profitably employed. Its recovery would save a valuable metal, and also save large sums of money now spent by steel mills to make the waste harmless before dumping it into streams. Several states now require that it be treated with a chemical to neutralize its action.

Among uses suggested for the recovered iron oxide is the preparation of metallic iron powder for what is called powder metallurgical uses. In these, powdered metals are pressed into molds and heated to form finished machine parts.

New methods of treating iron oxide make it usable in the "drilling mud" used in boring deep wells in oil fields. This mud is a very thin mixture of clay or other material in the water forced through the center of the drilling shaft to circulate around the biting bit and carry the debris up and out of the hole.

Iron oxide has also now been proved valuable in adding permanent color to cement building blocks. The colors vary from red to blue-gray. The oxide not only adds color but also improves the waterproofing qualities of the blocks. Such blocks never need painting and seldom, if ever, waterproofing.

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AERONAUTICS

Jets Combined with Flaps Give Dragon-Fly Agility

► JET-PROPELLED airplanes will have the agility of dragon-flies, if a newly patented idea lives up to its promise. It is the work of two Pennsylvania inventors, Charles A. Meyer of Drexel Hill and Donald Bradbury of Prospect Park.

Essence of the new design is the relation between the jet power units, which are embedded in the thickness of the wing, to a pair of hinged flaps on the trailing edge. When these are both directed downward, it gives the plane a big boost in take-off and fast climbing power. When they are directed upward, the plane does a power-dive. With one pair up and the opposite pair down, the plane "turns on a dime". Pinched together, they intensify the effect of the jet; opened wide in opposite directions, they minimize it and act as brakes in stopping.

The inventors have assigned their patent, No. 2,240,323, to the Westinghouse Electric Corporation.

Science News Letter, May 24, 1947

MEDICINE

Treatment Shrinks Cancer

Although no cures have been made, a chemical attack has reduced a cancer from the size of a baby's head to that of a baseball.

Reports from the meeting of the American Association for Cancer Research containing the top news in cancer research, covered by Jane Stafford, Science Service medical writer, follow.

A MEDICAL treatment for cancer and leukemia which made a stomach cancer shrink from the size of a baby's head to the size of a baseball in four weeks was announced at the meeting in Chicago of the American Association for Cancer Research.

The treatment involves a fundamental chemical attack on malignant diseases such as cancer and leukemia. It was originated by Dr. Maurice M. Black, 28-year-old physician and biochemist whose studies were interrupted by Army service which took him to the front in Germany. It is less than a year since he restarted his research at New York Medical College and Brooklyn Cancer Institute.

"No definite cures have been obtained," Dr. Black and his colleague, Dr. Israel S. Kleiner, stated emphatically.

The patient with the stomach cancer was a 70-year-old man who had such severe heart trouble that surgeons refused to risk operating to remove the cancer. He died of the heart trouble before the cancer could be cured, and, in fact, before Drs. Black and Kleiner could know whether the new medical treatment would have cured it.

The other patients treated also have been what doctors call "terminal cases," meaning they were in the last stages of their illness. One leukemia patient was so far gone that doctors would no longer give X-rays or any kind of treatment.

Shrinkage in size of the tumor mass, relief of pain, increase in weight and well-being and definite changes in the tumor as seen under the microscope are the encouraging effects of the treatment observed so far in cancer patients. In leukemia the blood picture and clinical symptoms temporarily improved.

Dr. Black and associates want it known that they do not feel they have yet reached their goal of chemical control of malignant growth, such as cancer. As one of them put it,

"We don't want to sound like charlatans, treating cancer by medicine given by mouth."

The medicines given are sodium fluo-

ride, iodoacetic acid and malonic acid. They were picked because they would inhibit or stop the cycle of reactions by which the cancer cell digests sugars and starches. Cancer cells have long been known to differ from normal cells in these reactions. Many scientists have tried, without decisive results, to check cancer growth by using chemicals to inhibit this sugar-digesting activity. Dr. Black decided to launch his chemical attack at one of three points in the cycle where active phosphate bonds are formed and liberated and where energy for further cell growth is produced.

Unfortunately, the cells can adapt themselves to the blocking chemicals. After sodium fluoride has had its effects, an accessory for phosphate bond formation develops. Dr. Black uses iodoacetic acid to block this. But in time, another accessory is found by the malignant cells, and malonic acid must be used. The cell can even adapt to this chemical, which limits the curative effect on the cancer or leukemia.

By continuing to study the process by which the cell adapts itself to chemical attacks, Dr. Black hopes to reach the goal of chemical control of cancer and leukemia.

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MEDICINE

One Bad Burn Can Start Skin Cancer Months Later

ONE BAD BURN, even though it heals promptly with a smooth scar, often is enough to stimulate the development of skin cancer at the burned spot months later.

This is true in the case of mice whose skins have been made highly susceptible to cancer, Dr. William L. Simpson of Barnard Free Skin and Cancer Hospital and Washington University School of Medicine, St. Louis, reported at the meeting in Chicago of the American Association for Cancer Research.

For humans, this finding is important



X-RAYING OIL FIELD—A sample of field rock is mounted in the apparatus where it is injected with oil, gas and water and then X-rayed. This reveals the behavior of fluids in the rock formation. The process is expected to net a greater percentage of oil.

in connection with the century-old question, still wrangled about by doctors and lawyers:

Can a single injury cause cancer?

Opinions on both sides have been based almost entirely on physicians' opinions and "often have been heated by the clash of strong personalities," Dr. Simpson said. "They have been offered freely, while experimental efforts to establish the validity of such opinions have seldom been carried out."

The experiments he reported were made on normal mouse skin and on mouse skin sensitized by treatment with a chemical, 20-methylcholanthrene, dissolved in anhydrous lanolin. This sensitizing treatment leaves the skin structurally and chemically similar to normal skin but with a greatly increased susceptibility to ordinary cancer-causing chemicals.

Three types of injury were inflicted on the mice: 1. burning with a hot glass rod; 2. crushing the skin with pliers; 3. a massive dose of X-rays.

The normal mouse only rarely developed a cancer in result to a single such injury. In the sensitized mice, there was no cancer after the crushing nor after

the X-ray burns. But in two groups of the mice burned with the hot glass rod, 42 out of 100 and 65 out of 100 developed cancer several months after the burn had

developed. In four-fifths of them, the cancer healed at the spot that had been burned.

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MEDICINE

New Anti-Cancer Weapon

Old Indian medicine from May-apple root may be an anti-cancer agent if it is not too toxic to use. It contains podophyllin.

Insert "American" before mandrake

► AN OLD INDIAN remedy, podophyllin from mandrake or May-apple root, is science's newest potential anti-cancer weapon. It may prove too poisonous to be useful for treating humans, but laboratory experiments in test tubes and mice show that it can destroy cancers.

The remedy's cancer-killing action in test tube experiments was reported by Drs. Richard A. Ormsbee and Ivor Cornman, of the Sloan-Kettering Institute for Cancer Research, New York, at the meeting in Chicago of the American Association for Cancer Research.

Similar results in mice have been obtained by scientists at the National Cancer Institute in Washington, Dr. M. J. Shear reported.

A laboratory accident like that which led to the discovery of penicillin led the Sloan-Kettering group to their discovery of the possible anti-cancer action that may be locked in the root of the mandrake or May-apple.

Drs. Ormsbee and Cornman had some cancer cells and normal skin cells growing together in test tubes. They would add this or that chemical to these tissue cultures, as scientists call them, to see whether the particular chemical had any different effect on the cancer cells than on the normal cells.

To their surprise, the cancer cells in one of the cultures started dying before anything had been added to the tubes except the nourishing materials. Serum from placental blood obtained when

babies are born is among the nutrient materials used. Checking back, they found that the serum in the tubes where the cancer cells died had come from a woman who had been given podophyllin.

She had gotten the remedy as treatment for venereal warts. These warts are not cancerous. They are destroyed by putting a preparation of podophyllin in oil on them. This was discovered by another scientist in 1942.

Drs. Ormsbee and Cornman immediately started testing podophyllin itself and found it would destroy the cancer cells. They do not know what chemical in podophyllin is responsible. Podophyllin itself is simply an alcoholic extract of the mandrake or May-apple root. It is known to contain at least three and probably more different chemicals.

Scientists at the National Cancer Institute started investigating podophyllin because it was known to be a mitotic poison. This means that it stops mitosis, the process by which growing cells divide into new cells. Their hope was that it would destroy cancer by stopping the cell division process of the wildly growing cancer cells. Injecting it into mice that had cancers, they found that it does damage the cancers.

Whether it will also damage normal body tissue and thus prove unsuitable for use is a problem both groups of scientists are now working on. They are also trying to find what the anti-cancer chemical is in the old Indian remedy.

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MEDICINE

Cancer from Femininity

► SUPER-FEMININE mothers may nurse their infant daughters into a dangerously over-feminine state. Breast cancer may result.

Evidence for a relation between breast cancer and over-femininity, in the sense

of unopposed action of female hormones, was announced at the meeting in Chicago of the American Association for Cancer Research.

The evidence comes from studies by two University of Minnesota cancer re-

searchers, Drs. Robert A. Huseby and John J. Bittner.

Dr. Bittner a few years ago startled the world by his discovery that breast cancer may result from a virus sucked up in the mother's milk.

The mothers and daughters are mice. But there is increasing evidence from studies of human cancer patients of a relation between male and female hormones and cancer in men and women.

Here is how Dr. Huseby explains it so far as the mice are concerned:

During the last 10 years, three factors have been established as being necessary for the spontaneous development of breast cancer in mice:

1. A genetic (hereditary) susceptibility to the development of breast cancer;

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2. Adequate production and utilization of hormones;

3. The presence of a virus, the milk agent, transmitted from mother to daughter in the milk during nursing.

In the past year Dr. Bittner and Dr. Leo Samuels at the University of Utah have chemically analyzed the hormones secreted by groups of female mice that were alike except for having or not having the milk agent. They found that females with the milk agent had less male hormone than females without the milk agent. (Females, human as well as mouse, produce some male hormones in their bodies.)

"Experiments carried out in other laboratories as well as here," Dr. Huseby stated, "indicate that male hormones inhibit breast hormones as far as the development of normal breast tissue and subsequently of breast cancer.

"It is possible therefore that the mechanism by which the milk agent virus influences the development of breast can-

cer in mice is by reducing the production or changing the metabolism of the male sex hormones produced by the female mice, thus allowing the female hormones to act almost unopposed and breast cancer results.

"Thus the action of this virus may not be directly upon the cells of the mammary gland (breast) but rather only indirectly as it affects the hormone system of the animal.

"This," Dr. Huseby cautioned, "is of course only a theory at the present time and much work must be done to prove or to disprove the correctness of it."

On the human side, scientists listening to him undoubtedly recalled the recent reports of successful treatment of advanced breast cancer in women with male hormone, of breast cancer in men with female hormone, and the earlier reports of success in treating cancer of the prostate in men by castration or by female hormone.

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MEDICINE

Drug to Ease Cancer Pain

► TO EASE the pain of patients dying of cancer, physicians now have a new drug that is better than morphine for this purpose.

Its name is metopon, short for methyl-dihydromorphinone hydrochloride. It was developed in the course of a search that started almost 20 years ago for a drug that would relieve pain as morphine does but would not make addicts of persons using it over long periods. The search for the non-addicting morphine was carried on by scientists at the Universities of Virginia and Michigan, the U. S. Public Health Service, the Treasury Department's Bureau of Narcotics and the Massachusetts state health department.

Metopon is derived from morphine. Like morphine, it has both-addiction and tolerance qualities. That is, gradually increasing doses are required and it could make addicts out of users of it. But it takes longer for the tolerance and addiction to develop, which gives it advantages over morphine.

It is effective in relieving pain when given by mouth. This means patients will not have to have it injected subcutaneously, as morphine must be given for relief of cancer pain. It does not cause nausea and vomiting and mental dullness as morphine often does.

These advantages place metopon "in

a class by itself for the treatment of the chronic suffering of cancer," the editor of the *Journal of the American Medical Association* (May 17) states in reporting to physicians generally the availability of the new drug.

The drug will be available only in capsule form and only for cancer patients. It can be obtained only by physicians, only from Sharp and Dohme or Parke, Davis and Co., and only after the official narcotic order form has been approved by the National Research Council, the organization responsible for the new drug's development.

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HEALTH

Dust DDT on Grass To Control Dog-Ticks

► DDT CAN KEEP dog-ticks under control if dusted on the grass and shrubbery where children and their pets play, state scientists of the U. S. Department of Agriculture. They recommend a powder containing 10% of DDT, applied at the rate of one ounce per thousand square feet. Where more extensive areas are to be covered, a dusting of from two to four pounds per acre is called for, with extra applications along roadsides and paths.

Dog ticks, sometimes called wood

ticks, are not merely repulsive but dangerous. They have been convicted of carrying the germ of Rocky Mountain spotted fever, which is a serious disease with a high mortality rate.

The dustings will not completely eradicate the ticks, but will keep their numbers down. It is advisable, during tick season, to go over dogs and children quit carefully every evening, removing all ticks with a pair of tweezers. It is risky to handle the pests with bare fingers.

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ENGINEERING

150-Foot Barges Launched With Dynamite by Navy

► EXPLODING DYNAMITE on ships is a new way of speeding Navy ship-to-shore operations in an assault on an enemy beach.

The dynamite is used to launch 150-foot barges from the ships. In tests at the Navy's Advanced Base Proving Ground at Davisville, R. I., a pier instead of a ship's deck was used, with dynamite blasts cutting bolts and sliding the barges into the water safely. Another successful method of launching from a ship's deck is to tilt the deck and send the barge over the side on rollers.

The barges are composed of steel pontoons.

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PSYCHOLOGY

Don't Expect Babies To Act Like Typewriters

► WORKING GIRLS who get married may be disappointed if the baby does not act like a typewriter. Result: psychological problems for the mother, behavior disorders for the child.

Some of the difficulties of 22 office girl mothers, culled from the files of the psychiatric service of the Johns Hopkins Hospital, Baltimore, were reported to the American Psychiatric Association meeting in New York by Dr. Irving L. Berger of Cleveland.

These mothers are used to a fixed routine and the efficient, smooth functioning of office machinery. They expect the same perfection and orderliness of behavior in the baby. Some children rebel. Others give up and become shy and dependent.

But with the second child, Dr. Berger found, the mother usually has a changed attitude.

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METEOROLOGY

USSR Helps Our Forecasts

Russian meteorologists cooperate with American scientists in making long-range weather predictions that depend on world conditions.

► FULL AND HEARTY cooperation from the Soviet Union is giving Americans better long-range weather forecasts, Chief F. W. Reichelderfer of the U. S. Weather Bureau stated.

The Soviets are actually taking the lead in some stages of weather cooperation with this country, Dr. Reichelderfer revealed. Plans for an exchange of weather experts between the countries were discussed when Dr. Reichelderfer visited Russia in the summer of 1945. Since then, a shortage of trained meteorologists forced the U. S. Weather Bureau to shelve the plans because all available men were needed for work in this country.

Last October, the Soviets brought up the matter. Five Russian weather scientists will soon arrive to begin studies with American meteorologists. Meanwhile the U. S. still lacks enough men to send American weathermen to the U.S.S.R.

The Weather Bureau chief said a five-man party of Americans will not be able to leave for Russia until after a meeting of the International Meteorological Organization next fall.

The IMO is an international organization which the Soviet Union supports

actively but it is not a United Nations group. The IMO was founded in 1878 and membership is not based on treaties at present.

Weather Bureau officials explained that the Soviet weather reports are "indispensable" for accurate forecasting. Our weather depends on conditions in the whole northern hemisphere or even the world rather than on conditions within our own boundaries.

Weather data from Russia and Siberia come into the Weather Bureau several times daily. This information has been broadcast on intermediate wave bands by the Russians. It is sent in International Code and picked up by U. S. Navy stations at Manila, P. I., and Guam. The Navy relays the data to Weather Bureau stations on the West Coast; from there, they are sent to Washington.

The information on weather conditions in Russia and Siberia is especially important in long-range forecasting. Any weather forecasts more than two days in advance are termed "long-range" by meteorologists.

We send regular weather reports to Russia under a mutual agreement.

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CHEMISTRY

Process Saves Rayon Cost

► THE DROP from six dollars to sixty cents a pound in the selling price of rayon from 1920 to 1946 was due largely to a method developed by chemists to recover for re-use the great amount of caustic soda used in the process, the American Institute of Chemical Engineers was told in St. Louis.

The process used, technically called dialysis (which in simple language means a type of filtering) was described by H. C. Green, J. H. Koffolt and J. R. Withrow of Ohio State University. In the viscose rayon industry, for every pound of rayon produced approximately one and one-quarter pounds of caustic soda are required.

The recovery of the caustic soda, a

chemical known to housewives as lye, is important in preventing stream pollution as well as in saving money for rayon manufacturers and users. At the present time, both it and the soda ash from which it is made are among the world's scarce chemicals, a scarcity that is seriously affecting the production of many needed materials.

The recovery of the caustic soda in the rayon industry is by use of what is called a colloidal membrane, the scientists explained. A colloid is a jelly-like substance, such as glue or starch, but colloidal membranes can be made of many other materials. The material to be recovered is collected from one side of the membrane, and the waste is dis-

charged from the other side.

The fundamental principles involved in the use of colloidal membranes in the separation by diffusion of unlike materials have been known for years and used in laboratories. It has been applied on an extensive commercial scale, using manufactured membranes, only for the past two decades.

Greatly extended uses are promised in the future. It was pointed out by the university men that the first commercial application of dialysis was in the beet sugar industry where the extraction of sugar is accomplished by diffusion through the natural membranes formed by the beet cell walls.

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ZOOLOGY

Baby Gray Squirrels Have Urge to Climb

See Front Cover

► EVEN THOUGH the baby gray squirrels shown on the cover of this SCIENCE NEWS LETTER are only a few weeks old and their eyes are still closed, they have the urge to climb when placed on the bark of a tree.

As they grow up and venture out into the world on their own, their survival will depend on their agility in climbing and jumping. At the bark of a dog or the glimpse of a hunter they must be able to disappear in a flash by climbing a tree or jumping from limb to limb until they find a safe hiding place.

The photographer, George A. Smith, Quarryville, Pa., gently lifted the baby gray squirrels out of their nest and placed them on the bark of a tree. After the photograph was taken, the furry little creatures were returned to their nest.

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PHOTOGRAPHY

Camera for Detectives

► A MINIATURE camera for detectives, built to resemble a metal matchbox, is the invention of Joseph Stoiber of Rochester, N. Y., assignor to the Eastman Kodak Company. The lens assembly is sunk into the body of the camera, and its aperture concealed except at times of actual use by a slide. Patent 2,420,628 has been granted this device.

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MEDICINE

Chemicals Halt 'Flu Virus

Apple pectin and a mold chemical stop the activity of the influenza virus in mice and may be valuable to humans. They are not toxic.

DISCOVERY of two chemicals that can stop the influenza virus, one of which might become a remedy for the disease, was announced at the meeting in Philadelphia of the Society of American Bacteriologists.

One of the chemicals comes from a mold that lives in the soil. The other is apple pectin.

The mold chemical is called LL 47. The letters stand for the Larchmont Laboratories of Schenley Distillers Corporation, where it was discovered. The number indicates that it was the 47th of more than 300 such substances tested. It was reported by Drs. A. J. Liebmann, D. Perlstein and G. A. Snyder.

Very cautiously, these scientists said that LL 47 stops the activity of influenza virus in mice as well as in developing chick embryos. Tests in human 'flu sufferers were not mentioned and presumably have not yet been made. Large doses can safely be given to mice, showing that it is not a toxic substance and might safely be used if further studies show it likely to be valuable.

The mold this chemical comes from is a member of the large aspergillus family. It is obtained by much the same methods Schenley scientists use for producing penicillin from the penicillium mold.

Unlike penicillin, LL 47 has no action against germs of the bacteria class, such as streptococci and pneumonia germs. But LL 47 acts against a virus, which penicillin does not do. With one possible exception, it is believed the only mold chemical that is effective against a virus. Whether it will prove effective against other viruses is not yet known. The exception is a mold chemical a South American scientist has reported to be effective against the yellow fever virus.

The anti-flu virus activity of apple pectin was reported by Drs. D. W. Woolley and R. H. Green of the Rockefeller Institute, New York. They reported only that apple pectin checks or prevents multiplication of the influenza virus in developing chick eggs.

This finding was made in attempts to determine why the flu virus makes chicken red blood cells clump together.

The Rockefeller scientists tested a number of sugar and starch chemicals including apple pectin and flax seed mucilage. These stopped the red-cell clumping by the virus. Then they found apple pectin would stop virus growth in developing chick eggs.

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PHOTOGRAPHY

Lab Camera Develops Photo in Thirty Seconds

IN A MILLIONTH of a second a photo is taken. Thirty second later, the finished photo is projected on a screen. A new rapid-action camera combination for taking and developing pictures was announced by General Electric. Used in studying surges of current on electric power lines, it is a non-portable laboratory device, not for amateur use.

The camera has a speed of one-mil-

lionth of a second. Used in combination with a cathode ray oscillograph, the camera photographs what appears on a television-like screen when a surge of electricity is applied to the generator and transmitter equipment under test.

As soon as the photograph is taken, the operator pushes a button setting in action automatic developing equipment which completes its job in 24 seconds. Then the film passes into a projector which shows the negative, enlarged ten times, on a ground-glass screen on one side of the camera.

Several quick taking-developing-viewing cameras have been developed. Eastman Kodak Company produced a system by which a person can be photographed and see his picture on a screen 15 seconds later. Polaroid Corporation developed a process adaptable to small cameras by which finished pictures are obtained in one minute.

More recently, a heavy-weight camera, complete with developing and fixing equipment, which takes a pair of pictures at the same time and has them ready one minute later for viewing with a stereoscopic device was announced by the Kannestine Laboratories of Houston, Texas.

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SPLIT SECOND PHOTO—This apparatus contains a camera which will take a picture in a millionth of a second and a developer that takes only 25 seconds. A projector throws a picture on the circular screen at the right end.

AERONAUTICS

Alternating Current To Power Airplanes

► **ELECTRIC CURRENT** of the alternating type, the kind used ordinarily in homes, will provide the power in many airplanes of the future. It will replace the generally-used present direct current.

The first practical application of alternating current electrical plants for aircraft was revealed by Westinghouse engineers. Plants of this type are to be installed on two giant Army bombers, the Consolidated B-36 and the Northrup Flying Wing. Experiments with alternating current on planes date back 25 years, but all earlier installations were experimental.

The principal advantages of alternating current in planes are weight-saving, added efficiency, and trouble-free operation, especially at high altitudes. The engineers state that the new installations will give 50% more power per pound of weight than comparable direct current generators. They operate at 208 volts as compared with the 30-volt direct current generators, therefore use smaller wire, saving much weight.

Alternating current permits the use of induction motors. These have no troublesome commutator brushes, the contact plates on their shafts. These brushes wear out very rapidly at high altitudes, causing much trouble. The new generators are essentially the same as ordinary types, the main difference being in size.

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ARCHAEOLOGY

Fort Diggings May Solve Mystery of Lost Colony

► **CLUES** in the first great American mystery case, the disappearance of the "lost colonists" from Roanoke Island, North Carolina, have been discovered in excavations on the site of Sir Walter Raleigh's fort, the Department of Interior disclosed.

Diggings at the site of the fort where the English colonists disappeared more than three and one-half centuries ago have revealed the ditch or moat of the fort. Near the bottom of the moat, archaeologists found a hand made brick and a large piece of strap iron. These may be products of the ill-fated settlers who arrived at the island in 1587.

Near the fort, a pit with expertly-

fired charcoal sticks has been found. The charcoal might have been prepared for use in heating homes or for a forge or for gunpowder. The fact that the charcoal was abandoned in the pit may indicate that the colonists left their fort hastily.

Under the leadership of Governor John White, the colonists settled on the island in 1587. Governor White returned to England and did not get back to his colony until 1591. The colonists had disappeared and the only clue to what had happened to them was the mysterious inscription, "Croatan", found on a tree or post.

Sir Walter Raleigh, and later colonists at Jamestown, the first permanent English settlement in America, were unable to find traces of the "lost colonists."

Outlines of the fort have been reported as late as 1896, but excavations now underway may dig up more clues to help unravel the historical mystery.

Science News Letter, May 24, 1947

HORTICULTURE

Bailey Medal to Reward Efforts of Young Gardeners

► **BEST GARDENS** raised by American boys and girls this summer will win awards of the new Liberty Hyde Bailey medal, sponsored by the National Garden Institute. This medal replaces the earlier General Douglas MacArthur medal, of which nearly 50,000 have been given to young gardeners during the past two years. Only 6,000 of the new Bailey medals will be struck this year, so that the competition is expected to be especially keen.

The new bronze medal bears the image of Prof. Liberty Hyde Bailey of Cornell University, dean of American horticultural scientists. Now in his ninetieth year, he is still exceedingly active. He spent a few months last winter on an airplane exploration trip in South America, getting home in time to celebrate his eighty-ninth birthday on March 15.

To be eligible for the award, the boy or girl must belong to a group such as a science club, a 4-H club, or a scouting organization, that is supervised by a recognized garden chairman or leader, and turn in a report on his project at the end of the season.

(Detailed information will be supplied on application to Andrew S. Wing, Executive Secretary, National Garden Institute, 598 Madison Avenue, New York 22, N. Y.)

Science News Letter, May 24, 1947

IN SCIENCE

NAVIGATION

Flying Lifeboat Promises Value in Life-Saving

► **A GLIDER** that flies and floats gives promise of becoming standard life-saving equipment of the future to rescue the shipwrecked or downed aircraft crews. Hull tests have just been completed in the experimental towing tanks at Stevens Institute of Technology.

As a glider, the 36-foot long lifeboat is towed by a searching plane to the scene of a disaster and released when survivors are spotted. Wings and tail are ejected when it rests upon the water. A small gasoline engine then powers it as a motorboat. Its guide in locating survivors is its mother plane which circles the region, constantly in touch with the lifeboat by two-way radio.

Development of this "flying lifeboat" is a project of the U. S. Coast Guard which expects to use it in rescue work where other methods fail. It was designed by Aereoaffiliates, Inc., Tuckahoe, N. Y. One of the major problems was the design of the hull to meet landing requirements and also be seaworthy. The tests indicate these essentials have been met.

Science News Letter, May 24, 1947

NUTRITION

Better Food Utilization Causes Inherited Fatness

► **INHERITED** overweight is the result of more efficient food utilization. Drs. G. E. Dickerson and J. W. Gowen, of Iowa State College, announce in *Science* (May 9). The hereditary factor reduces food requirements per unit of gain and produces "fatties" primarily by increasing the food intake and by reducing the energy expended, especially for activity, they find.

Both of these effects increase the energy available for storage as fat, whereas the first raises only slightly, and the second reduces, the energy dissipated in body work.

The evidence, by the way, came from studies of mice, undertaken to learn more about fattening swine. But it may apply to men and women.

Science News Letter, May 24, 1947

THE FIELDS

PSYCHOLOGY

Desire to Be a Martyr Caused by Love Hunger

▶ THE ABNORMAL desire to suffer and be a martyr is not a sign of hatefulness in the sufferer, but shows his need for love, Dr. Bernhard Berliner, of San Francisco, told the American Psychiatric Association in New York.

It is a fundamental aspect of Western culture, he said. Dr. Berliner disagrees with the Freudian psychiatrists who consider that the person who apparently gets pleasure out of his own pain demonstrates an inverted desire to inflict pain.

Every patient of this type, he said, had an unhappy childhood. He does not love pain for itself but because the pain unconsciously represents some loved person who once caused him pain.

Science News Letter, May 24, 1947

CHEMISTRY

New Method More Practical For Producing Methylamines

▶ WHEN the ammonia gas that gives pungent effect to the ordinary household water solution is added, chemically, to wood alcohol, valuable chemicals known as methylamines are formed. Few besides chemists know about them, but they are employed in making many things in daily use.

They are used in de-hairing hides to make leather, vulcanizing rubber, materials to kill germs, explosives, textiles, photographic developers, and drug-gist preparations.

Wood alcohol is known to chemists as methanol. To form the methylamines, ammonia and methanol vapors are passed over a catalyst. This is one of the many types of materials that promote chemical action without being affected chemically themselves.

One difficulty in making methylamines in the process described, the American Institute of Chemical Engineers was told in St. Louis by R. S. Egly and E. F. Smith, of Commercial Solvents Corporation, is that three different methylamines are formed, one of which has little value as yet. This is known chemically as trimethylamine. They explained how it can be produced

in the mixture in lesser amounts. In the past, it has been separated and burned as a waste product.

The treatment suggested has to do with the length of time the vapors are allowed to remain in contact with the catalyst, and a proper choice of temperature and pressure for the reaction. The addition of water suppressed trimethylamine production, and had very little effect on reactions to the other amines.

Science News Letter, May 24, 1947

PHYSICS

Electric Braking to Make New Subway Cars Safer

▶ ELECTRIC BRAKING will promote safety on 200 new cars now under construction for New York subways. It will be used in combination with ordinary air brakes, and the two together will cut stopping-time one third.

This equipment, and all other electrical appliances for these new cars, is under construction by Westinghouse Electrical Corporation. The braking system, which will include improvements over earlier types, is what is known as electric dynamic braking.

It is a system in which the electric motors that ordinarily drive the cars operate in reverse as generators, driven by the momentum of the car. This action creates a braking effect which is transmitted by the gears to the axles and wheels.

Another improvement in the electrical system of these new cars will be the use of four 100-horsepower motors, one on each axle, instead of two 200-horsepower motors, the usual equipment. While the total power is the same, the new arrangement gives quicker starting pick-up speed because the power is applied directly to each of the four axles, instead of to two only.

In designing the electrical equipment, Westinghouse engineers aimed at both greater riding comfort and increased operating efficiency. A feature that adds particularly to comfort is the spring-suspension of the motors, together with gear assemblies operating on roller bearings.

Ordinarily, motors are mounted directly on the axles. Their weight increases the jar at every place where rails join. These spring-suspended motors, connected by flexible coupling with the gears, cannot pass their vibrations on to the car and passengers.

Science News Letter, May 24, 1947

PHYSICS

Supersonic Laundries To Remove Dirt from Clothes

▶ SUPERSONIC LAUNDRIES may come before planes can fly faster than the speed of sound.

Very high frequency sound waves are being tested as an aid to removing dirt from clothes. Sir Edward Appleton, secretary of the British Department of Scientific and Industrial Research, disclosed that sound waves of such high frequency that they cannot be heard may revolutionize laundering processes.

He explained that dirt is held to a fabric by electrical attraction. Soap and other solutions, called detergents, are now used to break this electrical attraction.

But if current research is successful, sound waves may do part of the job in the future. Supersonic vibrations are being used to shake out the dirt particles from clothes. Sound waves would also emulsify the dirt in the cleaning solution to keep the dirt from getting back on the clothes.

The idea of using sound waves to shake dirt off fabrics was developed from the wartime Asdic submarine detector.

Science News Letter, May 24, 1947

MEDICINE

Dye Used in Photography May Cure Elephantiasis

▶ A DYE USED in photography may turn out to be a cure for one of the tropical diseases most dreaded by our forces stationed in the South Pacific during the war. This was elephantiasis, the repulsive condition sometimes resulting when filariasis, a worm-caused disease, is not treated and becomes chronic.

Cotton rats infested with the worms almost invariably were cured by the dye, Drs. Arnold D. Welch, Lawrence Peters, Ernest Bueding, Arthur Valk, Jr., and Aeme Higashi of Western Reserve School of Medicine in Cleveland report in *Science* (May 9).

The dye they used is known as No. 863 for short. It is one of a number of cyanine dyes which the Western Reserve scientists investigated for the Army and the Office of Scientific Research and Development. Cyanine dyes are indispensable in photography as color sensitizers.

Science News Letter, May 24, 1947

NAVIGATION

Submarines of the Future

Faster submarines will be real underwater boats, making use of the German snorkel that makes it possible for them to stay under water for months.

By A. C. MONAHAN

► THE SUBMARINE of tomorrow will be a different kind of steel fish, a true underwater ship. It will be run by atomic power. It will be able to cruise completely submerged for weeks at a time.

The old veteran submarines of the last war—with their proud markings showing enemy ships sunk—are obsolete victims of engineering progress.

From the atomic bomb there will be snatched the power of fission. From the Germans there will be adapted an air-snatching device, the snorkel, and a radically streamlined hull for speed.

These submarines will be able to escape detection and destruction in a future war, even if the enemy uses the smartest anti-submarine methods we developed in the war. Greater range and increased load capacity will be built into them.

American underwater boats of today are subject to the same anti-submarine measures that so effectively cleared the Atlantic during the war of the Nazi U-boat menace. These measures are now known to all nations.

Escaping Detection

An important requisite of an effective submarine is the ability to escape detection, but if detected to escape destruction. This means greater underwater speeds, and the ability to remain deeply hidden in the ocean for months if necessary. The new types now proposed would have these requirements, plus greater range and increased carrying capacity.

There are some who believe that the submarine as a war weapon was doomed with the advent of the atomic bomb. Naval officers do not agree. However, the atomic bomb turned their eyes toward atomic energy as a type of propulsion power. Its immediate use for this purpose is not to be expected. Scientists have a long road ahead before atomic energy is harnessed for powerplant uses.

"Atomic energy is certainly the perfect answer to submarine propulsion requirements," Vice Admiral Charles A. Lockwood recently stated. "Once worked out it becomes an unlimited power source, and more than that, it would require no oxygen supply for operation. The submarine at present is still chained to contact above the water for air—either by surfacing or the use of long breathing tubes."

Lots of Room Needed

Atomic propulsion plant in a submarine is going to require a lot of room, he added, but another officer states that space now used for fuel storage would be available for war missiles.

The Navy has no intention of waiting for atomic energy before building new submarines. Already plans have been made for underwater craft that will, in part at least, be less easily destroyed by present-known anti-submarine meas-

ures. They will be better able to withstand atomic bomb explosions from lessons learned at the Bikini tests last summer, and they will incorporate German U-boat developments made too late in the war to be of much help to the Nazis.

Germany started the war with what was then regarded as advanced types of U-boats, but toward the end of the war had far superior craft in service or bottled up in German waters. For the development of this superior U-boat, Allied anti-submarine measures were largely responsible. Nazi craft in the Atlantic were being detected and sunk at a rate that even Hitler could not stand.

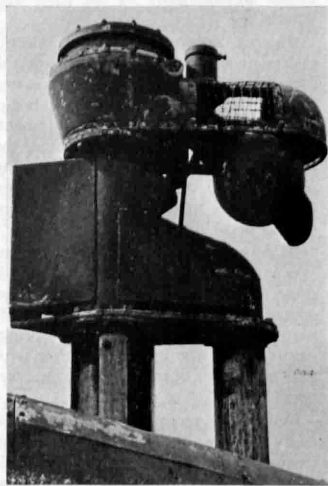
The Germans had reached a point where they faced complete defeat unless something could be done to turn the tide of the battle in the Atlantic. Therefore scientists and engineers were put to work in desperation to overcome the situation by developing U-boats safe against the anti-submarine measures. They were successful, to an extent, and produced submarine accessories and new craft which, if available earlier, might have prolonged the war.

German Snorkel

The German "snorkel" system was one of these important developments. It has a breathing tube that can be used when the submarine is relatively near the surface but still hidden under the water. This tube is raised and lowered like a periscope, and provides fresh air for the ship's diesel engines and for the crew. Vessels with snorkel need not come entirely to the surface to recharge power batteries. In fact, many remained submerged the entire time they were away from their ports, sometimes up to 70 days.

Another important German development was a radically streamlined hull to take full advantage of increased battery capacity, both resulting in higher underwater speed. This increased speed, even though for limited periods, increased the difficulties of submarine detection and destruction. These submarines could catch up with a fast convoy, discharge their torpedoes, and get far away in a short time.

Investigators from America and Brit-



AIR FROM ABOVE—The snorkel on German submarines enables them to stay submerged at least 70 days.

ain found in Germany, after the war, blueprints for a submarine which was to have even greater submerged speed. Hydrogen-peroxide gas turbine engines would provide propulsion power, at least for limited periods when spurts were needed. It was to have an estimated underwater speed of 24 knots, which is more than present American submarines can make on the surface even at full power.

The U. S. Navy is considering the German developments in submarines, experience gained with our own vessels during the war, and also the question of guarding against anti-submarine measures such as were successfully used against Nazi U-boats. The Navy has two of the German so-called Type 21 submarines in operation for testing and evaluating. During the war our submarines were materially much better built than the Germans', an American officer states, and we had superiority in electronics, sonar and torpedo fire-control gear.

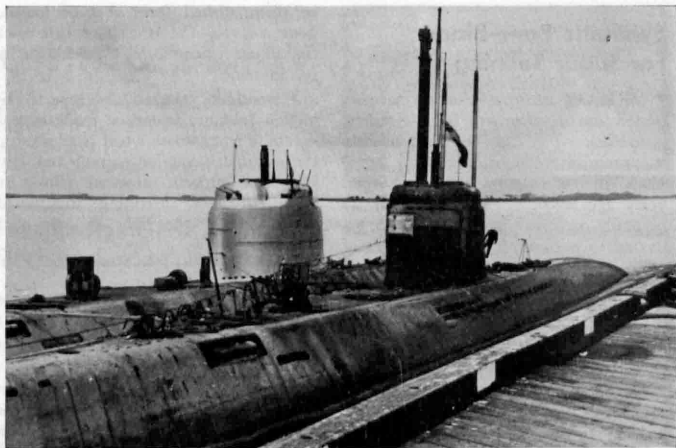
Anti-Submarine Measures

Anti-submarine measures that so successfully cleared the Atlantic, and now make new-type underwater craft necessary, include visual detection of surfaced U-boats recharging batteries, or electrical methods involving sound or magnetism by which completely submerged ships were located. The actual "kill" was by shell-fire or depth-bombs.

Three of these electrical methods were used. The most successful, according to the Navy, is known as "sonar." Other methods used magnetometers and sono-radio-buoys. Sonar is credited with sinking a majority of the 996 enemy submarines sent to the ocean bed during the war.

Sonar depends upon reflected underwater sound waves. Special equipment is lowered under the keel of the boat to send out sound waves and to receive reflected back by the hull of a submerged U-boat. Tiny tubes of nickel alloy, with coils of wire around them, form electromagnets which elongate or contract with changes in their electric flux. They send out a "ping" and receive back waves that generate an electric current from the tubes to produce a different sound. Operators can distinguish between reflected sounds from ship propellers and from submarine hulls.

The magnetometer is an air-borne magnetic instrument that in the air is allowed to trail below an airplane. It



TYPE 21—This German submarine is being studied by the U. S. Navy. The large column is the snorkel.

is sensitive enough to be affected by magnetic material below it, such as the steel body of a submerged U-boat. The same instrument is used in making land surveys for hidden ores.

The sono-radio-buoy is a small floating device which was dropped on the surface from aircraft when U-boats were suspected in a particular vicinity. The buoy contains a submerged hydrophone capable of picking up the underwater sound made by submarine propellers. The hydrophone triggers a tiny radio transmitter in the buoy that sends coded signals to the plane above. Somewhat similar equipment was used to detect submarines trying to sneak underwater into Allied harbors.

Submarines For 47 Years

Submarines have now played a part in the United States Navy for 47 years. It was in April, 1900, that the first was accepted by the Navy. It was the USS Holland, named after the American who built this submersible torpedo boat, as it was then called.

It is a long step from the Holland to the giant submarines used during the war, and to the new larger U-boats that the Navy desires to build. The Holland was 53 feet long, was powered by a 50-horsepower gasoline engine, had a speed of seven knots, a displacement of 75 tons, and only one tube for discharging its three torpedoes.

American World War II submarines,

of what is called the modern fleet type, are 310 feet long, have a displacement of 1700 tons, considerable speed, and are each powered by four diesel engines totaling 6,400 horsepower.

The Holland submersible was not the first underwater craft by any means. One was operated in the Thames river near London in 1620, it is claimed. Bushnell's one-man, screw-propeller tiny boat tried to sink a British ship in the Hudson river in 1776. Robert Fulton, of steamboat fame, built the Nautilus in France ten years before he built his steamboat.

None of these or others was taken seriously as war weapons, however. But in 1864, when the USS Housatonic was sunk in Charleston harbor, South Carolina, by an eight-man submarine, the possibilities of underwater craft began to be understood. Since then, almost constant efforts have been made to build better and bigger submarines.

Science News Letter, May 24, 1947

CHEMISTRY

Seaweed Jelly of Alginates

➤ A NEW KIND of seaweed jelly, useful in ice creams, confectionery, icings and the like, is the subject of patent 2,420,308, obtained by John I. Gates of Pasadena. It is a mixture of ammonium or sodium alginate with calcium alginate. Patent rights are assigned to the Kelco Company of San Diego.

Science News Letter, May 24, 1947

CHEMISTRY

Synthetic Bone-Black For Sugar Refining

► MELLON Institute scientists have reported the development of a synthetic bone-black which as a granular adsorbent promises to replace natural bone-black in cane-sugar refining. Several years ago scientists concluded that no naturally occurring material could be activated to possess all the advantages of natural bone-black. A synthetic cracked bone which could be carbonized in retorts designed for the manufacture of bone-black seemed to be the answer.

The new synthetic product has as its principal ingredient a synthetic hydroxyapatite which is so similar to natural bone that the X-ray diffraction pattern of the retorted material can not

be distinguished from that of natural bone ash. Apatite is a phosphate rock containing calcium, an element plentiful in bone.

A wood-like material, also reported by Mellon Institute scientists, made experimentally from waste wood is as good as the original wood for nailing and sawing. The process, now in pilot-plant stage, involves shredding the wood, then molding the fiber by use of a binder.

Science News Letter, May 24, 1947

ENGINEERING

New Combustion Engine Has Six-Cycle Basis

► AN INTERNAL combustion engine that operates on a six-cycle basis instead of the time-honored four or two cycles is the invention on which Ralph H. Hill of Flint, Mich., has obtained patent 2,420,136. The extra strokes suck in cold air, to cool the cylinder wall and piston head at their hottest surfaces. The number of cycles may be varied according to the thermal state of the engine.

Science News Letter, May 24, 1947

CHEMISTRY

Marihuana-Like Drugs

► FOUR PATENTS, 2,419,934 through 2,419,937, have been granted to Prof. Roger Adams, head of the chemistry department at the University of Illinois, on a series of synthetic drugs with marihuana-like action, which he states are useful in treatment of narcotic addiction by withdrawal. A typical compound is prepared by condensing pulegone, a derivative of pennyroyal oil, with one of the higher benzenes in the presence of a phosphorus-containing catalyst.

Science News Letter, May 24, 1947

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Do You Know?

Wartime poison gas in Australia being used to control the rabbit pest.

Backs of pages containing Braille letters for the blind are given a coat of shellac to keep the dots firm.

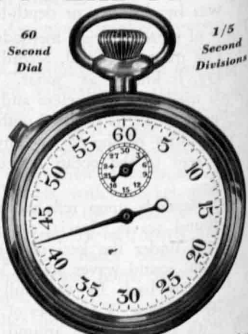
Clothing of white or yellow is less attractive to mosquitoes than clothing of black, blue and red, scientists say.

Cowpox in animals is really smallpox in the cow, but the germs do not find such favorable living conditions in the cow as they do in humans.

The use of very fine glass fibers in textiles for clothing and blankets is increasing rapidly; glass fibers contain no organic protein and therefore do not cause allergies, such as asthma.

Housewives make extra work for themselves when they wash greasy pots and pans with soap instead of scouring them; soap makes grease stick to metal surfaces.

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CHEMISTRY

Plastic from Common Clay

A COMMON CLAY called bentonite is now found usable in making a new plastic. In the process, it is used as a chemical, not merely as a filler. This clay has long been used in molds in foundries and more recently as "mud" in boring deep oil wells with rotary drills.

The research leading to the new use of bentonite was carried out at the Mellon Institute in Pittsburgh where pilot-scale production of one type has been in operation for a year.

In developing the new plastic, bentonite was viewed as an alkali salt of a mineral acid, and advantage was taken of the very small size of the silicate particles contained in it. In the process there is a chemical reaction between bentonite and resin-forming organic polymers, in such manner that the product might be regarded as what chemists call a copolymer of organic resin and the mineral.

Compression molded pieces of the new material show that it absorbs but

little water, has high resistance to chemical attack and can withstand high temperatures.

Science News Letter, May 24, 1947

ACOUSTICS

Few Radios Give Sounds With Highest or Lowest Tones

➤ YOUR RADIO is letting you down. When an orchestra plays, you do not hear the highest or lowest notes. Chances are you would like to hear them.

A scientist explained the situation at the Acoustical Society of America meeting in New York. Your ear is capable of hearing sound waves with frequencies from 16 to more than 16,000 cycles. The average home radio has a frequency range from about 75 to 5,000 cycles. Few radios will give you sounds above 10,000 cycles.

One reason for this has been that tests have shown that radio listeners do not want to hear a full frequency range but Dr. Harry F. Olson, director of research for the Radio Corporation of America, says this isn't so.

"Tests involving 1,000 listeners indicated a preponderant preference for the full frequency range," Dr. Olson reported.

Dr. Olson made his tests in a laboratory "living room." A six-piece orchestra played from behind a curtain. Listeners preferred the whole range of frequencies to the limited range of most modern radios.

Science News Letter, May 24, 1947

YOUR HAIR AND ITS CARE

By O. L. Levin, M. D. and H. T. Behrman, M. D.

Two medical specialists tell you what to do to save and beautify your hair, stimulate healthier hair growth, and deal with many problems, as:

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By COLONEL LESLIE E. SIMON

An accurate and dramatic record of Nazi science and business at war. Colonel Simon draws on his broad experience to explain—with examples—not only the extent to which the Germans succeeded or failed, but *why* they did.

This absorbing book analyzes the factors that kept many new devices from completion. It describes, organization by organization, the lack of coordination among scientific groups of the Army, Navy, and Air Forces; it reveals the jealousy that existed between scientists and engineers.

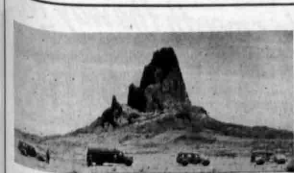
Of particular interest are the descriptions of new scientific developments relating to the more important researches in interior ballistics and terminal ballistics, exterior ballistics and fire control, aerodynamics, and instruments and measurement technique.

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BOTANY-ETHNOLOGY

NATURE RAMBLINGS

by Frank Thone



Flowers for the Dead

➤ MEMORIAL DAY, or Decoration Day as it is often called, was a kind of natural growth. After the fratricidal strife of 1861-65 there were tragically many raw graves all over the land. Surviving kinsfolk of the valiant young dead men sowed grass and planted shrubs and flowers, as had been the custom for ages.

A custom so universal easily becomes formalized into law. May 30 was fixed upon in northern states as a most suit-

able date, mainly for the very practical reason the greatest wealth of garden flowers is available in the northern half of our country at that time. Southern states at first did not have the uniformity in observation that prevailed in the North. Some, for the same pragmatic reason that moved their erstwhile antagonists, had their memorial days earlier—spring comes sooner in the South. More chose the birthday of Jefferson Davis, president of the ill-starred Confederacy, which falls on June 3.

But this nation has had three wars since then—three wars in which the descendants of both Blue and Gray wore uniforms of the same color, fought shoulder to shoulder against the same enemies, were laid side by side in the same rows of battlefield graves. Stranger still, they were all given the same name by foreigners, both allies and enemies: "Yankees", or more briefly, "Yanks." It is even probable that when tall young men from Tennessee or Texas gave the Rebel yell as they closed in on an enemy position there were cries of "verdamme Yankees!" So it seems well that those who have died for us, in peace as well as in war, should have a unified day of remembrance.

That part of that remembrance should take the form of flowers is simply part of basic human nature. How far back in time the practice of decorating burial-places with flowers may go there is simply no telling. Certainly it was well developed in the oldest cultures of Egypt and Mesopotamia, which were highly evolved and mature when the record of written history began. It can hardly be doubted that the custom goes beyond that, far back into prehistory.

Flowers are used as burial ornaments not merely because of their consoling beauty but for a reason deeper than that. Because they die in autumn and are buried all winter, yet arise again in spring, they symbolize immortality. In them, we have made visible "the resurrection, and life everlasting."

Science News Letter, May 24, 1947

METALLURGY

Coke Consumption Cut

➤ COKE CONSUMPTION in blast-furnace operation is cut by blowing in heated carbon monoxide to speed the ore reduction process, in the process on which S. P. Kinney of Crafton, Pa., received patent 2,420,398.

Science News Letter, May 24, 1947

SAFETY

Underground Building Best Defense from Air Attack

➤ THE BEST defense from air attack is underground. That is the verdict of Army Air Forces officials who have been studying Germany's underground aircraft production installations.

The Air Materiel Command said that the Nazis had a total of 143 factories in production underground. Twenty percent of the German airframe industry, nearly 60% of the aircraft engine and jet production and virtually all of the V-weapon work were underground.

Today, the Germans' underground installations are rusting, due to water seepage. They had other troubles with their underground factories, including noise absorption, gas proofing, dust control and others.

But AAF officials believe that with adequate planning, the underground installations could have protected German industry against any weapon used against the Nazis in World War II.

Science News Letter, May 24, 1947



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THE CHEMISTRY AND TECHNOLOGY OF PLASTICS—Raymond Nauth—*Reinhold*, 522 p., illus., \$9.50. A technical book on plastics; divided into sections on thermosetting resins, thermoplastic resins, cellulose plastics, synthetic rubber, natural resins and plywood, and mold design and equipment.

DEVELOPMENTAL PHYSIOLOGY OF THE GRASS SEEDLING II; INHIBITION OF MESOCOTYL ELONGATION IN VARIOUS GRASSES BY RED AND BY VIOLET LIGHT—Robert L. Weintraub and Leonard Price—*Smithsonian Inst.*, Pub. No. 3869, 14 p., paper, 15 cents.

ELECTRONICS FOR YOUNG PEOPLE—Jeanne Bendick—*Whitelsey House*, 175 p., illus., \$2. The simple line illustrations make this story of electrons very clear.

FUNDAMENTALS OF NAVAL WARFARE—Lee J. Levert—*Macmillan*, 488 p., \$5. Starting with the battle of Salamis in 480 B. C., this author also analyzes modern naval warfare and weapons.

GERMAN RESEARCH IN WORLD WAR II—Col. Leslie E. Simon—*Wiley*, 218 p., illus., \$4. An extraordinary analysis of German wartime developments: rocket weapons and jet propulsion; the wind gun, super gun, and sound used as a weapon. The organizational set-up which produced these weapons is discussed, revealing that lack of coordination between civilian and military prevented the full application of the knowledge each possessed.

HOW TO KNOW THE LAND BIRDS—H. E. Jacques—*W. C. Brown*, 196 p., illus., spiral bound \$1.50, cloth, \$2.50. A carefully thought out key to bird recognition. Grand for field trips, and includes map indicating general habitat of species.

HOW TO RECOGNIZE AND CONTROL TERMITES IN ILLINOIS—B. G. Berger—*Illinois Natural Hist. Survey*, Circular 41, 44 p., illus., paper, free. A discussion of measures to control this wood-destroying insect.

THE LAND AND WILDLIFE—Edward H. Graham—*Oxford Univ. Press*, 232 p., illus., \$4. A discussion of good land management as related to wild life conservation also deals with using wastelands to furberars and waterfowl[†] productively and prevention of soil erosion.

LOW-PRESSURE LAMINATING OF PLASTICS—J. C. Hicks, asst. by R. J. Francis—*Reinhold*, 162 p., illus., \$4.50. A careful discussion of this phase of plastic work.

THE MASTER HAND; A Study of the Origin and Meaning of Right and Left Sidedness and Its Relation to Personality and Language—Abram Blau—*Am. Orthopsychiatric Assn.*, 206 p., \$4.50. Research Monograph No. 5 of the American Orthopsychiatric Association presents a critical survey of the various theories advanced to date.

MODERN PLASTICS ENCYCLOPEDIA, *Plastics Catalogue Corp.*, 11th ed., three vols., 1,556 p., illus., \$8.50.—Complete information on plastics. Vol. 1 is a reference to the most recent developments, vol. 2 is devoted to processing, vol. 3 contains 10 special charts to facilitate reference and handling.

PERPETUAL TROUBLE SHOOTER'S MANUAL, VOL. XV, *John F. Rider*, Manual Series, 2000 p., illus., \$18. A large manual to solve servicing problems of multi-band receivers; among other features, contains a separate "clarified schematic" diagram for every band of every multi-band set put out by manufacturers in 1946.

PHILOSOPHY, ITS SIGNIFICANCE IN CONTEMPORARY CIVILIZATION—Hirsch Lazaar Silverman—*Bruce Humphries*, 36 p., \$2. Written for laymen to help them arrive at a workable philosophy of life.

PRINCIPLES OF RADAR—Staff Members of Mass. Inst. Tech.—*McGraw-Hill*, 2nd ed., 12 chapters, unvaged, illus., \$7. For use as a textbook in the Radar School at M.I.T., this revised edition brings up to date a book that proved itself in wartime.

THE PSYCHOANALYTIC STUDY OF THE CHILD—*Int. Univ. Press*, Vol. II, 424 p., \$7.50. The second volume of this annual has chapters on problems of child development, clinical problems, guidance work, education and sociology and the history of child psychiatry.

RADIO BROADCASTING AND TELEVISION—Oscar Rose, ed.—*Wilson*, 120 p., \$1.50. An annotated bibliography of over 1000 items surveying the field of radio from every angle except the technological. Included are programming techniques, content, advertising.

RESEARCH PLANNING MEMORANDUM ON LABOR MOBILITY—Gladys L. Palmer—*Social Science Research Council*, Pamphlet 2, 22 p., 25 cents. The second in a series of groups of topics which represent gaps in existing knowledge, this brochure was prepared for the Committee on Labor Market Research.

SOUR CREAM COOKERY—Barbara Brown—*Barrows*, 250 p., \$2.50. A compilation of recipes using sour cream, sour milk, buttermilk and cottage cheese; a help to anyone planning meals to include an adequate amount of dairy products.

TELEVISION TECHNIQUES—Hoyland Bettinger—*Harper*, 237 p., illus., \$5. This manual covers problems of equipment, composition of the picture, photography, script-writing, direction of the play and basic principles of production. It will be useful to all engaged in this industry.

THE THORACIC MUSCLES OF THE COCKROACH PERIPLANETA AMERICANA (L)—C. S. Carbonell—*Smithsonian Inst.*, 22 p., illus., paper, 20 cents. Pub. No. 3890. A paper on the internal anatomy of the cockroach to aid those using this insect for experimental work.

Science News Letter, May 24, 1947

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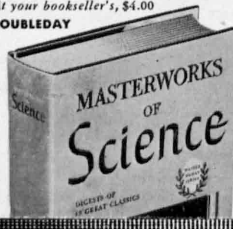
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❁ **ANTI-FOGGING** agent, for use on eyeglasses, automobile windshields and windows, is a water-clear liquid that is used to dampen the cloth used in cleaning. An invisible film is left on the glass that prevents fog formation for a relatively long time.

Science News Letter, May 24, 1947

❁ **INK**, to mark permanently glass, porcelain, rubber, photographic films and other laboratory materials, requires no heat to fix. Available in four colors, it can be removed while wet with water but, after drying, is resistant to most chemicals and to heat.

Science News Letter, May 24, 1947

❁ **BROADCASTING** truck, in use in the New York metropolitan area, contains a complete broadcasting studio equipment and radio telephone connection with transmitters at a central station. It has four different short wave transmitters, the usual recorders, and a roof platform for reporters.

Science News Letter, May 24, 1947

❁ **EYE-WASHING** fountain is designed for installation in factories where eye-injuring substances in liquid, vapor or dust form are present. It is an aluminum wash-stand, formed to fit over the eyes, equipped with drain and two adjustable water sprays for flushing purposes.

Science News Letter, May 24, 1947



❁ **WINDOW CLEANER**, with a long jointed handle, enables a housewife to wash the outsides of windows while standing erect on the inside. Made of light magnesium, it weighs only 13 ounces, including its reversible cleaning head which has a felt side for washing and a rubber squeegee for wiping.

Science News Letter, May 24, 1947

❁ **METAL CANS** with transparent plastic covers are handy in the household

because their contents, from buttons to brads, can be viewed without removing the top. They are made in ten convenient sizes, and have an ornamental finish.

Science News Letter, May 24, 1947

❁ **MUSIC** console for the home, housing both radio and a record player, has a table top over the record player that is raised like an elevator by operating an electric switch. Objects on the elevator need not be removed because the top remains level.

Science News Letter, May 24, 1947

❁ **STEEL** hand stamp, to put individual initials on tools of wood or metal, is made of high-grade tool steel with the desired letters cut into one end. In use, it is placed against the object to be marked and tapped with a hammer.

Science News Letter, May 24, 1947

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