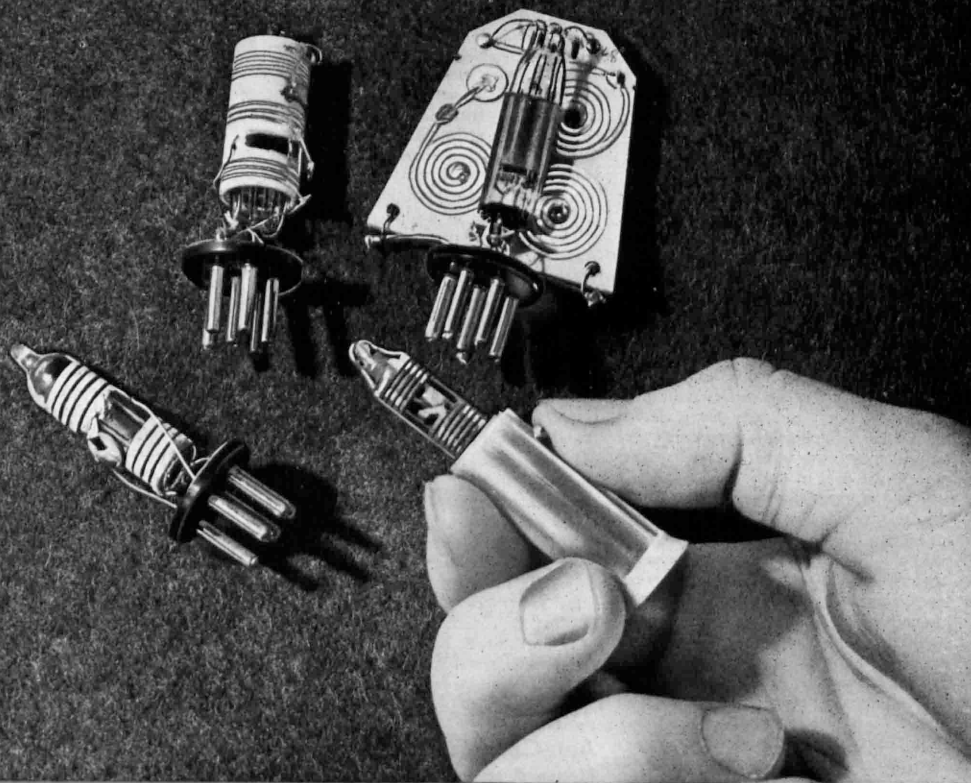


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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE • MARCH 22, 1947



Radio of the Future

See Page 186

A SCIENCE SERVICE PUBLICATION

VETERINARY MEDICINE

Bats Threaten Livestock

Vampire bats, south of the Mexican border, infect livestock with paralytic rabies when they bite them to get blood. All animals can be attacked.

► FOOT-AND-MOUTH disease is not the only potential danger to American livestock that lurks below the Mexican border. There is a paralyzing and killing disease called paralytic rabies, known to be carried by vampire bats, which inoculate their victims when they bite them to get a meal of blood. Animals of all kinds may be attacked.

Existence of two colonies of these bats within 300 miles of the Rio Grande, much closer than any previously known, was reported by Charles E. Mohr of the Academy of Natural Sciences of Philadelphia, in an address before the National Speleological Society meeting in Washington. Speleologists are persons who make a special study of caves, natural habitat of bats.

One of the two caves reported by Mr. Mohr is 300 miles from the border; the other, which harbors a smaller vampire-bat colony, is only 250 miles from American soil. Mr. Mohr discovered both colonies while on a cave-exploring expedition in Mexico some months ago. None was found in caves closer to the Rio Grande. However, the species is known to be migratory, and may move closer. Also there is danger of its spreading the infection by biting other bats when the disease drives it mad.

"Control measures," said the speaker, "include vaccination of cattle, screening of human habitations, and destruction of infected bats. It is important, however, that no ill-conceived campaign be carried on against our useful Northern insectivorous bats."

Other diseases known or suspected to be bat-borne include yellow fever, scrub typhus, Chagas' disease, all affecting man, and a tropical trypanosome disease of horses known as murrina.

In the course of his address, Mr. Mohr also made mention of a newly-disclosed war secret, reminiscent of the Old Testament narrative of Samson's destruction of the Philistines' wheat by loosing foxes with firebrands tied to their tails. Only in the modern version, bats bearing tiny incendiary bombs with time fuses were to be released from special containers dropped from bombers. The bats would make for the nearest caves, and of course

start roof fires. The trick actually worked when tried on a dummy village in the West. However, it was not used in combat.

Science News Letter, March 22, 1947

MEDICINE

Constitutional Factor Helps Cause Colds

► IF YOU HAVE a cold, as who does not right now, maybe you can blame it on your constitution. Colds are caused by a virus of the germ family, but studies on some 700 school boys who had almost 5,000 colds over a period of years suggest to scientists that a constitutional factor plays an important part in the causation of colds.

The studies were made by Drs. Frederick Sargent, Olive M. Lombard and Virginia W. Sargent at Phillips Exeter Academy and are summarized in the *Journal of the American Medical Association* (March 15).

Each boy tended to have the same number of colds year after year, though there was significant variation from boy to boy in the number of colds each had. For the period of the study, the individual boys tended to vary more than the variation between years. This led the scientists to the view that a constitutional or an environmental factor plays a significant part in the causation of colds. Since the environment at Exeter Academy does not vary much, the constitutional factor gets the blame.

What the constitutional factor consists in is not known, but the scientists suggest further research on this point.

Science News Letter, March 22, 1947

MEDICINE

Anti-Germ Substance Holds Hope Against Diphtheria

► DISCOVERY in diphtheria germs of a new anti-germ substance that might become a disease remedy of the future is announced by Drs. J. N. DeLamater and R. J. Goodlow of the University of Southern California School of Medicine. The discovery almost belongs in the

lost and found columns. Through the fortunes of war the new anti-germ substance has been lost and in their report to *Science* (March 7) the Southern California scientists suggest to other scientists a search for it in diphtheria germs they may have in their laboratories.

The anti-germ substance was originally found in diphtheria germs from a human patient which were being used for instruction at the U. S. Naval Medical School. In test tube experiments, the substance checked the growth of a number of germs, including those causing one kind of paratyphoid fever.

With the close of the war, one of the scientists was discharged from the Navy and the studies of the anti-germ substance were interrupted. The diphtheria germs producing it had to be stored for eight months and during this period lost the ability to produce the anti-germ material.

Drs. DeLamater and Goodlow report its existence now because it is apparently the first such anti-germ material discovered in diphtheria germs and if a search is made, it may be found again.

Science News Letter, March 22, 1947

TEXTILES

Non-Woven Fabrics Have Great Strength

► NON-WOVEN fabrics, with strength both lengthwise and crosswise, have been recently developed which are finding many household and other uses ranging from tapes to table cloths. Their strength is due to the rayon staple used and to the two directions in which the staple stretches.

In this arrangement of the fibers, the non-woven fabric resembles woven cloths. Non-woven fabrics are essentially multiple webs of rayon or other fibers in which the fibers are bound together by various means. The new type is a development of the American Viscose Corporation in New York, in which the bonding is the result of blending adhesive fibers of cellulose acetate with non-adhesive fibers such as cotton, wool or rayon. Heat and pressure are used to perfect bonding.

In earlier non-woven fabrics, the rayon or other fibers have stretched in one direction as a rule. This gave strength in the direction of the fibers, but less strength in other directions. Rayon fiber is preferred in the new material because its longer length and uniformity impart greater strength.

Science News Letter, March 22, 1947

CHEMISTRY

Aluminum in Banks of Clay

Dr. James I. Hoffman received the Hillebrand prize for developing a practically limitless source of aluminum from clay. Process is expensive.

► THE DREAM of making shiny aluminum metal from a clay bank is coming true.

For nearly four years an experimental plant at the National Bureau of Standards has been producing from kaolin clay a raw material which is the practical equivalent of bauxite, hitherto the only practical ore of aluminum.

Dr. James I. Hoffman, government chemist, was given the Hillebrand prize of the Washington Chemical Society as evidence that his colleagues consider his process a major chemical achievement.

There is now no practical limit to the amount of aluminum for a modern world that can be produced. Literally billions upon billions of tons of clay suitable for use in the Hoffman process underlie the southern states alone. It is the same kind of white or cream clay that is used in coating paper and in some ceramic uses.

Only about six years' supply of high-grade bauxite exists in the country according to a wartime estimate. The hurry-up development of a new process was begun as a hedge against the possibility that submarine warfare would cut us off from the British and Dutch Guiana bauxite upon which the U. S. is largely dependent.

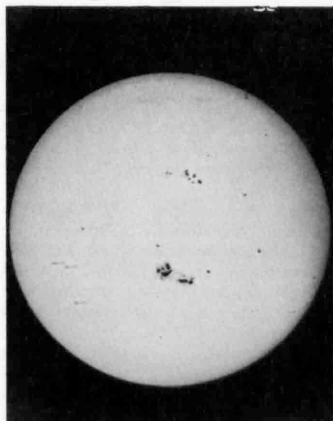
The primary barrier today to the use of clay in aluminum production is cost. To produce clay of the needed purity by the Hoffman process costs about twice as much as high-grade bauxite under present conditions.

In the Hoffman process the clay is first roasted, then digested with dilute hydrochloric acid, next filtered to remove the insoluble silica. The aluminum is obtained as hydrated chloride by adding hydrochloric acid gas. The rest of the process consists of separating and washing the aluminum chloride crystals, heating them to drive off the chloride and then recovering the hydrochloric acid for reuse.

Since it was developed as a government research, anyone will have a right to use the new process.

Dr. Hoffman was given the prize in part because he helped make the atomic bomb by showing how ether could be used to remove the impurities from crude uranium. This is rated a top chemical step in obtaining uranium for the bomb, but less can be said publicly about this work than about the aluminum process.

Science News Letter, March 22, 1947



GIGANTIC—Easily visible through smoked glass, this sunspot grew to be one of the five largest on record. The photograph of the immense pock-mark disfiguring old Sol's face was made on March 10 by Mrs. L. P. Day of the U. S. Naval Observatory.

themselves to new conditions," Dr. Fried states in reporting Prof. Sinitin's results.

The success of these experiments, Prof. Sinitin points out, depends on a proper feeding of the transplanted organs. For instance, diffusive, non-vascular feeding is peculiar to the frog heart.

Science News Letter, March 22, 1947

GEOLOGY

Earth Estimated to Be 3,350 Million Years Old

► EARTH'S AGE is about 3,350 million years, according to the newest estimate. It was made by Prof. Arthur Holmes, University of Edinburgh geologist, on the basis of a careful re-examination of radioactive lead ores from some of the oldest rock formations in the world.

Most lead is radiologically inert, but like almost all elements lead has isotopes, or atoms of slightly different atomic weight than the majority, and some of these isotopes are radioactive. They constantly give off atomic particles, and in the course of time become ordinary, non-radioactive lead atoms. From the proportion of these radioactive lead atoms in a given sample of lead-containing mineral it is possible to calculate how long this process has been going on.

Prof. Holmes' newest estimate of the earth's age has been communicated to the editor of *British Nature*.

Science News Letter, March 22, 1947

SURGERY

Frog's Heart Transplanted

► MAKING a composite, living body out of two parts of bodies belonging to different animals, neither of which could live by itself, is the possibility seen by scientists in heart transplanting experiments performed by Prof. N. P. Sinitin of the Gorky Medical Institute in Moscow.

A frog in Prof. Sinitin's laboratory has now started its second year of new life with a transplanted heart.

"This brilliant experiment," comments Dr. W. Fried for the Soviet Scientists' Antifascist Committee, "speaks not only of the possibility of transplanting hearts to cold-blooded animals but shows that animals continue to live normally for a long time after the opera-

tion."

Prof. Sinitin has devoted the last ten years to the problem of heart transplantation in cold-blooded animals. Two years ago he stated in a report to Science Service that some of the frogs had lived over 100 days with transplanted hearts and did not show any differences in behavior from normal frogs. In the spring both males and females which had been operated on went through a normal nuptial period which ended with spawning.

He has also recorded long life in a number of frogs in which he transplanted hearts of opposite sex.

"Biochemical contrasts are thus seen to disappear and alien hearts adapt

SOCIOLOGY

Hungry Ruins of Greece

▶ ONCE THE MOST powerful nation in the world, Greece today occupies the world's spotlight as a hungry country with little hope of ever feeding her people.

Main occupation of the 7,000,000 inhabitants of modern Greece is agriculture and the main product is wheat. Yet, even before the country was battered in World War II, the chief products which Greece bought from other countries were cereals and other foods.

About the size of Alabama or North Carolina and shaped a little like Florida with the northern arm reaching east instead of west, Greece is a mountainous country with many lakes and rivers.

Only one-fifth of the land can be farmed, but three-fourths of the people are employed in agricultural pursuits.

Greece will always depend on other countries for her food.

Before the war Greece paid for food with exports of horticultural products such as tobacco and currants. Perhaps her most famous product is olives, which compete with those of other Mediterr-

anean countries on world markets.

Buried in the rough terrain of Greece is a variety of important minerals. But Greece must depend on other countries for coal, and the minerals have not been extensively mined.

The Greek peninsula is one of the leading sources of chromite from which comes the chromium of many types of high grade steel. Other minerals are lignite, iron ore, iron pyrites, magnesite, lead, emery, marine salt and the famous Greek marble.

The invasions and occupation of World War II, while part of the cause for Greece's plight today, are an old story in the history of the country. Since the days of the "Glory that was Greece" 2,500 years ago, probably no area in the world has seen so many wars.

Battered and helpless, modern Greece is built on the ruins of one of the greatest civilizations in history. On these ruins today is one of the toughest problems President Truman and other world leaders must face.

Science News Letter, March 22, 1947

DENTISTRY

Treatment to Check Decay

▶ REGULAR USE of an anti-decay chemical treatment of the teeth of all children is now recommended by the American Dental Association.

The chemical is sodium fluoride. It would be applied by the child's dentist in a 2% solution to the crowns of the teeth twice a year after a preliminary series of at least four treatments for each tooth.

Because sodium fluoride is a poison, the treatment should be given by a dentist who is in position to guard against the use of too strong a solution or other potential dangers.

The treatment is advised as a general preventive measure, but does not have any 100% guarantee that it will prevent tooth decay in all children. It has cut down the occurrence of decay as much as 40%, dentists who have tried it have reported.

The treatment is not effective on the teeth of grown-ups, so far as present evidence goes.

Putting a sodium fluoride solution on children's teeth to protect them against

decay follows the discovery made some years ago that children born and raised where the community drinking water contained fluoride had teeth relatively free from decay. In a number of communities, fluoride is now being added to the water supply in the hope of reducing the amount of decay in the teeth of future generations of children. The direct application of the chemical to the teeth has been tried by a number of scientific investigators, but until now dentists generally have not used the method. Even now more study is needed to determine the best frequency and method of using the treatment but results have been good enough so that the dental association is ready to advise all dentists to use it.

The mechanism by which fluorides inhibit tooth decay is unknown. Current theories are that the fluorides provide a protective factor in tooth enamel and that the drug inhibits the growth of acid-producing bacteria believed to be a cause of dental decay.

There is no acceptable evidence, the association has stated, that bone-meal

preparations and tablets containing fluorides now marketed as dietary supplements are effective in diminishing the incidence of tooth decay.

Science News Letter, March 22, 1947

CHEMISTRY

Packing Material Resists Corrosive Hydrofluoric Acid

▶ PACKING MATERIAL resistant to the almost universal corrosive hydrofluoric acid, is made by James D. Covington of Dallas out of a mixture of talc and flake graphite. Rights in his patent, No. 2,417,351, are assigned to the Soco-Vacuum Oil Company.

Science News Letter, March 22, 1947

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MEDICINE

Soviet Disease Weapons

Russian scientists are working on prevention rather than cure of mental diseases. They have discovered how muscles respond to nerve impulses.

► NEW WEAPONS are being forged in the Soviet Union. They are against mental disease, not human enemies. They consist largely of kindness and understanding.

First hand reports of this and other scientific developments in Soviet Russia are given American scientists by Dr. Stuart Mudd of the University of Pennsylvania in *Science* (March 14).

How muscles are chemically sensitized to nerve impulses transmitted through another chemical is another Soviet scientific discovery revealed in Dr. Mudd's report. The sensitizing chemical is adenosine triphosphate. Small quantities heighten the excitability of muscles and increase muscular contraction. Large quantities have the reverse effect. The chemical is released with every muscular contraction.

Patients with dysentery one day are well the next as a result of a treatment widely used by Soviet doctors. The treatment consists in doses of the germ-eating bacteriophage.

Conditioning for mental health is favored over psychoanalysis by Soviet psychiatrists. People conditioned to kindness, security and group solidarity will not crack mentally, is the Soviet theory. So they start the conditioning treatment in early childhood. Its effectiveness "was illustrated in a remarkable way at the Institute for Pediatrics in Leningrad," Dr. Mudd reports.

During the terrible period of the siege of Leningrad, this Institute of about 2,000 students of pediatric medicine and 1,000 child patients was for months under direct bomb and shell-fire. There were many direct hits and the windows were shattered three separate times. No mental breakdowns of the type labelled neuroses occurred in any of the patients during all this time. The director of the Institute, Dr. N. A. Mendeleva, attributes this to the confidence of the patients in those who cared for them, the calmness of all the staff, and the fact that nothing was ever permitted to interrupt the routine.

The story of the spoon of tears gives some of the spirit of Soviet scientists.

Tears contain lysozyme, an anti-germ chemical which is a sort of ancestor of penicillin. Soviet doctors use it to treat nose, throat and eye infections and as a spray in laryngitis. All the best singers are said to insist on it. The lysozyme is obtained from horse-radish and from egg-white. When Dr. Mudd asked one of the scientists, Prof. Ermoljeva, why they did not use the original source of lysozyme, tears, she answered:

"In my institute there are not so many tears. Once I had tears and I remembered lysozyme and tried to catch the tears in a spoon, but then I had no more tears."

Science News Letter, March 22, 1947

PHYSICS

Face Mask, Respirator Save Day's Heat Loss of Calories

► A HEAT LOSS equal to the calories from a day's food might be saved by the Army's new mask and respirator now being tested by the Army Ground Forces Task Force "Frigid" at Fairbanks, Alaska, and in the Antarctic.

The respirator follows the principles of good power plant engineering. Engineers will recognize it as a heat exchanger such as is used to recover the heat from gases or liquids before they are discarded up the chimney or down the sewer from power plants.

The power plant in the body of a man exercising moderately at a temperature of 40 degrees below zero Fahrenheit loses heat equal to 1,730 calories in 24 hours in the breath exhaled from the lungs. Food supplying that many calories in a day is enough to maintain a sedentary worker in temperate climates. If the respirator is 100% efficient it could therefore save the equivalent of a day's food supply. Its actual efficiency will be determined from the tests now underway. It showed a "high degree of efficiency" in tests conducted under sub-zero temperatures at the Quartermaster Climatic Research Laboratory at Lawrence, Mass.

The respirator is light, simply constructed and made of soft rubber to fit snugly about the nose and mouth. It is worn partly within and partly outside



KEEPING WARM—Arctic mask and regenerator save about a day's food in calories as proved by U. S. Army Ground Forces. U. S. Signal Corps photograph.

the arctic face mask. The portion within the mask is held in place by the pressure of the mask. The section outside the mask consists of a cylindrical tube which is filled with metal wool made of copper or stainless steel.

The metal wool absorbs the heat contained in the vapor expired by the breath and releases this heat to the inspired air. In this way, the upper respiratory tract and lungs of the wearer are protected against extremely cold air and body heat is conserved.

Science News Letter, March 8, 1947

ENGINEERING

Steam Locomotive Powered With Novel-Type Rotors

► A NOVEL steam locomotive, with a power plant that is of neither turbine nor reciprocating type, has been patented by Benjamin C. Monroe of Tuscola, Ill. Power-converting elements consist of pairs of rotors, each shaped like a thick-waisted figure-8, meshing into and turning each other like a pair of toothless gears. Several of these, mounted on a common axle, insure a continuous flow of power. The whole set-up is enclosed in a casing that has a figure-8 cross-section.

Science News Letter, March 22, 1947

AERONAUTICS

Fog Clearing Idea Tested

Fog dispersal system tested in Akron airport is not substitute for present landing systems but may serve as approach to lighting system.

► THE FOG DISPERSAL system just installed and now under test at the Akron airport is for the purpose of clearing fog from immediately above the landing strip but primarily to determine its usefulness as an approach lighting system.

It is not intended as a substitute for instrument landing systems now being widely installed, but as an aid. These instruments guide planes through heavy overcast and bring them to low altitudes correctly positioned for landing, but for the actual touch, pilots need to see the runway. A fog dispersal system lifts the ceiling over the landing strip, giving clear vision of the paving.

Fog dispersal is not a new idea. The installation in Akron is an improvement over earlier types developed during the war and others developed since. It is a forward step in a system that will lift a fog effectively, and at not too great a cost, and at the same time may serve the other purpose because of the brightness of the flames used to disperse the fog.

The original fog dispersal system was developed in foggy England to enable bombers returning from missions over Nazi territory to make safe landings. In its simplest form it consisted of two troughs of oil or gasoline extending along the sides of the runways, the fuel being lighted by torches. It was called FIDO, short for Fog Intensive, Dispersal Of. The heat created lifts the fog from a hundred to several hundred feet.

In later systems pipes with spaced nozzles were used, and then came electrical methods of igniting the flares when needed by means of a switch located in the control tower. The system in Akron, designed and installed by the Babcock and Wilcox Company, uses fuel oil at an unusually high pressure which assures complete atomization and combustion.

This results in a brilliant flame of large area, having great fog-penetrating effect. The heat created is expected to be sufficient to clear the runway of fog, and it is thought that the fog-penetrating brightness of the flames may serve as an approach lighting system. It is a test unit; pilots landing at Akron will report their observations, and others flying over the

port will report on distances at which the light is found to be visible.

Science News Letter, March 22, 1947

PHYSICS-CHEMISTRY

Physicist and Chemist To Receive Franklin Medal

► THE SCIENTIST who directed the operation of the world's first chain-reacting pile and an English chemist famed for studies of the life processes of plants and animals are winners of the 1947 Franklin medal of The Franklin Institute in Philadelphia.

Dr. Enrico Fermi, Italian-born leader in the development of the atomic bomb and now a physicist at the Institute of Nuclear Research at the University of Chicago, and Sir Robert Robinson, professor of chemistry at Oxford University, England, will receive the medals April 16, Dr. Henry B. Allen of the Franklin Institute announced.

Dr. Fermi was awarded a Nobel Prize in 1938 for his studies of the physics of the neutron, while the English scientist was knighted in 1939 for his contributions to the field of organic chemistry.

Science News Letter, March 22, 1947

ICHTHYOLOGY

Airplanes Drop Lampblack In Attempt to Save Fish

► LAMPBLACK dropped from airplanes is being tested as a means of saving fish from drowning.

The lampblack is to be dropped on ice-covered lakes to melt the ice and permit air to reach the fish in the water below. Each year thousands of fish literally drown when thick ice prevents oxygen from getting to the water.

Strips of lampblack, dusted on the ice, are expected to absorb the sun's rays and melt the ice. The experiments are being tried on larger lakes in Wisconsin by the state Conservation Department after successful trials on small plots.

Russians have used soot to remove snow from fields in a similar project.

Science News Letter, March 22, 1947



MOLECULAR STILL—Powerful enough to "distill" solids and liquids never before vaporized, this still, developed by Gulf, creates a vacuum to evaporate substances into their molecular parts.

CHEMISTRY

Compounds Evaporated By Molecular Still

► LIQUIDS and solids never vaporized before yield to a high-vacuum evaporating process which is now being used to determine just what constitutes petroleum.

The equipment used is called a molecular still. It is a five-foot glass tower, in which the vacuum is obtained, with a complex system of electric leads, radio tubes, mercury boiler system, vacuum measuring apparatus, and a series of vacuum pumps. The vacuum obtained has less than one billionth of atmospheric pressure, it is claimed.

Within this vacuum, solids as well as liquids can be evaporated into their various molecular parts. Oils, greases and waxes are divided into several hundred components with a degree of separation never before obtained. These components are made for various tests relative to physical and other properties. Results are expected to be used in refineries in the production of improved petroleum products.

Science News Letter, March 22, 1947

MEDICINE

BAL Hope for Arthritics

Anti-war gas chemical makes gold treatments safer for those suffering with arthritis by relieving poisoning symptoms.

► AN ANTI-WAR GAS chemical is making gold salts treatment for arthritis safer. More than that, it may lead to even better treatment for rheumatoid arthritis.

This newest hope for arthritics is BAL. The letters stand for British Anti-Lewisite. Chemically, it is a kind of alcohol, 2,3-dimercaptopropanol. Designed by British chemists to save soldiers in case of gassing with arsenic-containing lewisite, BAL turned out to be a life-saving remedy for victims of bichloride of mercury and arsenic poisonings.

Some arthritis patients have been helped by gold salts, but gold, like mercury and other heavy metals, is a poison. The gold salts treatment was dangerous because it was hard to gauge a dose that would help the patient but not poison him.

BAL has been given to a dozen patients suffering from gold poisoning following gold salts treatment for arthritis. In all but one the poisoning symptoms were relieved. In that one, the rash and itching was not affected by the BAL treatment. Two of the patients were seriously ill. "Spectacular recovery" occurred in each of these cases.

Details of this new use of BAL are reported in the *Journal of the American Medical Association* (March 15) by three groups of physicians: Drs. Abraham Cohen of Philadelphia, Joel Goldman of Lewistown, Pa., and Alfred W. Dubbs of Allentown, Pa.; Drs. Charles Ragan and Ralph H. Boots of New York; and Drs. L. Maxwell Lockie, B. M. Norcross and C. W. George of Buffalo.

Hope of an even better treatment for arthritis appeared in the report by Drs. Ragan and Boots. BAL, they found, seemed to cause an earlier relapse of the disease temporarily following the gold salts treatment. Since BAL acts by reactivating certain enzyme systems in the body which have been poisoned by heavy metals, the gold salts apparently achieve their remedial effects by temporarily suppressing processes which cause activity in rheumatoid arthritis. The New York scientists do not elaborate the point but it suggests that scientists may see in

this work a lead to better understanding of arthritis and better treatment for it.

Science News Letter, March 22, 1947

BIOCHEMISTRY

Tomato Juice Knocks Out Athlete's Foot Germs

► GERMS of athlete's foot can be knocked out with tomato juice. Not the red kind that comes in cans, but the juice pressed from leaves and stems of the tomato plant, chemically freed of its green coloring-matter and concentrated. The active principle has been named tomatin.

This discovery was made by three U. S. Department of Agriculture scientists, working at the Department's great experiment station at Beltsville, Md. The men are Dr. G. W. Irving, Jr., Dr. T. D. Fontaine and J. W. Wood.

Besides the athlete's-foot fungi, tomatin has been found effective in stopping the growth of various other fungi and parasitic yeasts that cause disease in human beings and animals, including the

fungi that produce skin and scalp ringworm. All tests conducted there have been on cultures of the organisms themselves, in glass vessels. Clinical tests on actual human cases are now in progress at Duke University Medical School.

Tomatin was discovered about a year ago, as a result of a search for the reason why some tomato plants are resistant to fungus disease attacks and others are not. It was abundant in resistant plants; susceptible ones had little or none of it.

Since then, tomatin-like action has been obtained from the leaf juices of potatoes and green peppers, which are botanically related to tomatoes, also in the juices of cabbages and sweet potatoes, which are not. Juices of numerous other garden plants have also been tested, but have shown no activity.

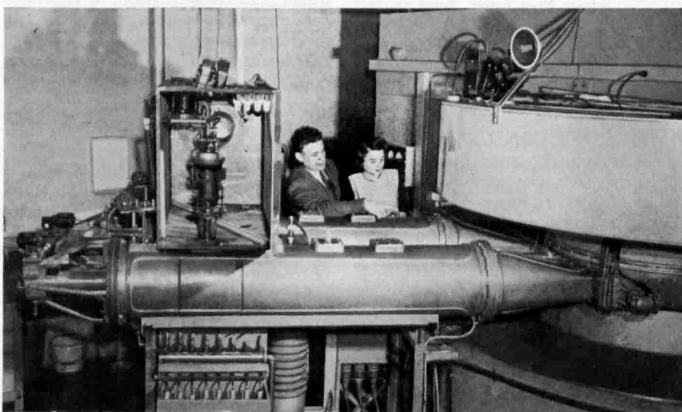
Science News Letter, March 22, 1947

TEXTILE CHEMISTRY

Impregnated Fiber Is Like Silk-Coated Cotton

► WHAT IS in effect silk-coated cotton is provided in a process on which Thomas C. Whitner of Elizabeth, N. J., has obtained patents 2,417,388 and 2,417,389. He impregnates the cellulose fibers with a chemical mixture in which silk has been dissolved, then removes the chemical vehicle in an acid bath, finally rinsing out all residues with water.

Science News Letter, March 22, 1947



THIRD LARGEST CYCLOTRON—Just placed in operation at the University of Pittsburgh, this atom-smasher provides 200,000-volt "pushes" for the ions circulating in the vacuum chamber, seen between circular tanks at right. Tanks contain 18 miles of copper coiled about magnet poles and cooled by 467 gallons of cyclotron oils developed by Gulf Research.

GENERAL SCIENCE

Dr. E. E. Day Tells House Committee of Science Need

► **SPEAKING** for 68 scientific and educational organizations, President Edmund E. Day of Cornell University, chairman of the Inter-Society Committee on Science Foundation Legislation, told the Interstate and Foreign Commerce Committee of the House, "We need a National Science Foundation to help provide facilities and to help train scientific workers to use them."

He declared the Foundation should:

1. Provide for the support of basic fundamental research without reference to the development of immediate practical applications.

2. Be free to investigate problems in any scientific area and by any appropriate method.

3. Provide for the training of young scientists.

4. Coordinate scientific research and the development and utilization of scientific personnel.

Dr. Day said scientists were more concerned over the caliber of the men chosen to head the foundation than the administrative setup for the organization.

"It is our feeling that the bill should not be so specific in details of procedure and organization as to hamper the administration in carrying out the objectives of the foundation," he told the committee.

Science News Letter, March 22, 1947

ELECTRONICS

EDVAC II to Calculate Census for Government

► **WHEN THE CENSUS-TAKER** next comes around, the chances are that the numerical facts you give him will be fed to EDVAC II, successor to ENIAC. The U. S. Bureau of the Census has just placed, through the National Bureau of Standards, a contract for the construction of one of these newest of all electronic computers that can out-Einstein Einstein.

ENIAC, which has just been completed, has already been made at least slightly obsolescent by EDVAC I, now under construction, because of its greater compactness and simplicity. And already newer and better EDVACS are promised by the creators of this family of robot lightning computers, Dr. John Mauchly and J. Presper Eckert, Jr.

Outstanding feature of these mechan-

ical mathematicians is a tank of mercury in which they "remember" data that have been fed into them, and when they are ready, on proper electronic signal, to deliver what they "know." They can also modify the contents of their mercury memories upon receipt of later instructions.

The EDVACS, as well as their older brother, ENIAC, are produced by the Electronic Control Company of Philadelphia.

Science News Letter, March 22, 1947

CHEMISTRY

Industrial Chemistry Finds New Uses for Fats

► **FATS**, though at present in short supply, are likely to pile up into surpluses in normal times, and therefore challenge industrial chemists to find new and profitable uses for them, Dr. Anderson W. Ralston, chief research chemist of Armour and Company, told an audience of his colleagues in St. Louis, after he had been presented with the Midwest Award of the American Chemical Society.

Until relatively recent times, about the only non-dietetic use for fats was in the production of soap and glycerin. Since glycerin constitutes only about a tenth of the total mass of fat, and fatty acids the other nine-tenths, the big problem is to find some use for fatty acids other than in soap.

One new way of making fatty acids useful is to combine them, at high temperature, with ammonia, which results in the formation of a group of compounds called nitriles. These have many economic applications.

Some of these compounds, especially laurionitrile, while odorless to human beings, seem to smell very bad to insects. Hence they can be used effectively in insect repellents.

Nitriles are also used as plasticizers for a variety of polymers, and their derivatives find wide uses as promoters of reactions in numerous industrial processes. Salts of amines derived from nitriles can be used in waterproofing building materials. These salts are also used in flotation processes for separating valuable from useless constituents of minerals, especially in preparing potash and phosphate fertilizers. Salts of amines with heavy metals have valuable disinfectant properties, and have found uses ranging from protection of seeds against fungus attack to preservation of iced fish during long-distant shipment.

Science News Letter, March 22, 1947

IN SCIENCE

ORNITHOLOGY

Smallest Owls on Earth Found in California

► **CALIFORNIA'S** admitted penchant for claiming the biggest things on earth has gone into reverse: a pair of the smallest owls on earth, hitherto not known west of the Colorado river valley, has been found in the Joshua Tree National Monument, about 125 miles due east of Los Angeles, by two zoologists of the University of California at Los Angeles, Dr. Loye Holmes Miller and A. J. Van Rossem.

Known as elf owls, the little gray-brown, yellow-eyed birds are only about two and one-half inches long—rather smaller than most canaries. They have been known previously only from the desert country east of the Colorado river valley, where they nest in abandoned holes drilled by woodpeckers in the giant tree-cactus, or sahuaro.

Science News Letter, March 22, 1947

MEDICINE

Better Artificial Arms, Legs, Made for Veterans

► **TWENTY THOUSAND** veterans and 65,000 war workers will soon walk more easily and be able to use their hands and arms more skillfully and easily with the aid of new and better artificial arms and legs developed through two years' research by American surgeons, physicists and engineers.

The new and better artificial arms and legs are now ready for large-scale production and distribution, Dr. Paul E. Klopsteg of Northwestern University, chairman of the National Research Council's committee on artificial limbs, announced recently.

A set of artificial arms that a person with both arms amputated above the elbow can fasten to his body without assistance is one of the developments.

An artificial forearm with a wrist that will rotate in a 180-degree arc when the forearm stump is turned in an arc of only 70 degrees is another development of American research engineers.

Science News Letter, March 22, 1947

THE FIELDS

OPTICS

Optical Glass Cleaned By Electron Bombardment

► **CLEANING GLASS** by bombarding it with electrons is something new. It is a method of preparing optical glass for television mirrors before the reflecting fine film of aluminum is applied.

This new optical-glass-cleaning process, which will have many other applications, is a development of Bausch and Lomb engineers, one of whom described it at the recent meeting of the Optical Society of America.

The process is carried out in a vacuum. The ground and polished optical glass is placed in a metal holder within a high vacuum bell, and bombarded with electrons from a tungsten filament similar to those used in ordinary electric lights. When the filament is heated by the electric current, the electrons are given off. Electrically, they are negatively charged particles, and they are attracted with force to the metal holder of the glass and to the glass.

Thus attracted, the electrons bombard the glass at a speed of several thousands of miles a second. They clean the glass of all moisture and other materials. After cleaning, the glass, still left in the vacuum chamber, is coated with aluminum by an evaporation process. In this, microscopic particles of the metal are evenly distributed on the glass in a very thin film.

Science News Letter, March 22, 1947

PHYSICS

Microscope Attachment Photographs Specimen

► **AN ATTACHMENT** for electron microscopes, which enables the observer to watch and photograph changes in a specimen as its temperature changes, is covered by patent 2,417,213, issued to Robert G. Picard of Collingswood, N. J. It consists of a heating lamp in a cylindrical housing, to be thrust in through an opening in the electron microscope tube near the specimen, which will be heated by radiations focussed through a lens. Rights are assigned to the Radio Corporation of America.

Science News Letter, March 22, 1947

MEDICINE

Paralysis of Alcoholics May Be Due to Arsenic

► **THE PARALYSIS** that alcoholics with polyneuritis get may be due to arsenic, not alcohol. Studies suggesting this are reported by Drs. Madelaine R. Brown and Jane L. Hastings of Boston in *Science* (March 7).

The signs and symptoms of arsenic polyneuritis are so similar to those in alcoholic polyneuritis that the doctors decided to investigate the possibility of arsenic being the cause in both kinds of polyneuritis. Fourteen patients with alcoholic polyneuritis were consistently excreting significant amounts of arsenic. Alcoholics who did not have polyneuritis and patients with polyneuritis not due to alcoholism did not excrete more than an occasional trace of arsenic.

The arsenic is not normally present in the body but is taken in with the food. It is possible, the doctors suggest, that the alcohol affects the storage of the arsenic which in turn contributes to interference with enzyme action in these already malnourished patients.

Science News Letter, March 22, 1947

MEDICINE

Ticks, Bedbugs, Fleas Spread Undulant Fever

► **ONE OF THE MYSTERIES** of undulant fever, serious incapacitating ailment which man gets from cattle, goats and swine, may have been solved in experiments by Dr. Raul M. Tovar of the Institute of Health and Tropical Medicine in Mexico City.

Ticks, bedbugs and fleas, he has discovered, may spread the germs of this disease.

Men, women and children may and often do get it through contact with infected cattle, goats and swine, or by drinking raw milk from infected cows or goats or eating ice cream made from raw, unpasteurized milk and cream.

Occasionally, humans get it without having had contact with infected animals or having consumed raw milk. How they get it in such cases has not previously been known.

In studies leading, apparently, to solution of this mystery, Dr. Tovar put ticks, bedbugs and fleas on guinea pigs and mice that had undulant fever germs in their bodies. The ticks, fleas and bugs became infected, getting the germs as they fed on the infected laboratory

animals. When they fed on healthy guinea pigs and mice, they gave the germs to these animals.

Bedbugs from bedsidings of undulant fever patients in Mexico City and ticks from a region in the state of Guanajuato where the disease occurs rather frequently were found to be infected with the germs.

The pests which were found naturally infected with the germs probably play an important role, Dr. Tovar states, in transmitting the disease from animals to humans and in conserving it in nature. In his report to the American Journal of Veterinary Research (Jan.) he states:

"The finding of naturally infected ticks justifies the complete cleaning of animals besides separating infected cattle to effectively control bovine brucellosis (the disease in cows)."

Science News Letter, March 22, 1947

MEDICINE

Urethane Is Hope For Leukemia Treatment

► **NEWEST HOPE** for a chemical treatment of leukemia, deadly cancer-like disease of the blood, is urethane, or ethyl carbamate.

In trials on mice and human patients this chemical gives as good results as X-rays. The tremendously high white blood cell drops to normal, the enlarged spleen and lymph glands are reduced in size.

Relapses, unfortunately, occurred in both mice and humans treated with the chemical. Some of the mice, however, held the improvement for almost two weeks after the urethane treatment was stopped. This is a relatively long time in mouse leukemia. The human patients have been treated too recently for doctors to know whether the treatment will prolong their lives. The chemical treatment has the advantage over X-rays in that it can be given by mouth, though in some cases it had to be stopped because of the nausea it caused.

Details of the mouse experiments are reported by Drs. Ruby M. Engstrom, Arthur Kirschbaum and Harry W. Mixer, of the University of Minnesota Medical School, in *Science* (March 7).

The human patients were treated by Drs. Alexander Haddow, Edith Paterson, Inez Ap Thomas, and Jean W. Watkinson in Manchester and London, England. Results were reported in the English journal, *Lancet*.

Science News Letter, March 22, 1947

RADIO

Lipstick Tube Broadcasts

Radio station fits into a lipstick tube and the receiving radio is on a tiny card. Many changes in radio are predicted from miniature developments.

By RON ROSS

See Front Cover

► Watch for these:

A radio on a plate the size of a calling card.

A broadcasting station with most of its components small enough to fit into an empty lipstick container.

Cheap, easily-changed plug-in assemblies for bigger home radios.

Ordinary phone calls put through more than 100 times faster.

Hearing aids a fraction of their present size.

"Printed Wire"

All of these are coming along with even more important developments made possible with "printed wire," sub-miniature tubes and midget batteries.

Thanks to these new achievements, you will be able to broadcast from your own tiny radio station combining the "calling card radio" and the "lipstick broadcasting station." Dr. Cleo Brunetti, an electrical engineer at the National Bureau of Standards in Washington, has broadcast with the midget station and heard programs on the card-size receiver.

The personal broadcasting and receiving station will fit easily in a man's coat pocket or in a corner of a woman's handbag.

Your powerful home radio of the future may be made up of assemblies which plug in like modern radio tubes. Instead of the complicated wiring in your present radio, simple plug-in units will be used for easy repairs. There may not be any wires in tomorrow's radio.

A new hearing aid, using sub-miniature tubes and flat, printed circuits, is one inch high and two and one-half inches long, complete except for the batteries and ear attachment.

The time it takes to ring your number when you dial your phone can be reduced to one one-hundred-and-thirtieth of the present time with a small "memory"

circuit which may be fitted in the ordinary handset. The tiny circuit would transmit information to the central office one-tenth of a second after you lift the phone.

These revolutionary developments in radio and electronics, some of which may be on the market in a few months, are being developed from a World War II achievement. Thousands of complete radio broadcasting and receiving stations were shot from guns and operated successfully to bring down enemy planes.

Scientific Achievement

The radio proximity fuze, also known as the VT (for variable time) fuze, ranks second only to the atomic bomb as a wartime scientific development. The fuze exploded anti-aircraft shells at the moment when they would do the most damage to enemy planes.

Small enough to fit into a few cubic inches, the tiny radio stations had to be rugged enough to be shot from guns or dropped thousands of feet in bombs. With its tiny radios, the proximity fuze increased the effectiveness of anti-aircraft batteries of the Allies in several crucial struggles during the war. In peacetime, the processes which made it possible to cram a radio station into a shell fuze may revolutionize manufacturing techniques and bring countless new conveniences.

Silver Ink

The tiny radios and broadcasting stations of the proximity fuze used "printed wire." Instead of copper wires, such as those used on your radio, flat lines of silver ink, a solution of fine silver or silver oxide, were stencilled on a small ceramic plate. Another stencil operation used a carbon solution to "print" on the resistors. Tiny tubes were soldered onto the flat circuit and small batteries supplied the power for the tiny radio.

That was the proximity fuze. Since the war ended, Dr. Brunetti and his associates in the Ordnance Development Division of the Bureau of Standards have

developed new processes for "printing" wire and other materials have replaced the ceramic plate.

The "calling card receiver" has circuits painted on a plastic card two by five inches. Two inches are turned under to produce a radio two inches wide and three inches long. It has four tiny tubes.

One Inch Tubes

Radio tubes have been developed which are one inch long and only one-eighth of an inch in diameter. These lie flat on the plate as soldered onto the "printed" circuit, instead of standing upright as the tubes do in your radio.

Power for the portable, card-type receiver comes from small batteries, thus far the largest part of the equipment. But scientists and battery manufacturers are at work on even smaller power producers than the tiny hearing aid batteries Dr. Brunetti uses in showing his radios.

The pocket radios will be embedded in a clear plastic for protection. A special plastic, known as NBS (for National Bureau of Standards) Casting Resin, has been developed especially for the miniaturization program.

Plastic Protection

Transparent, it is a lightweight plastic which guards the radio against shock or weather. "Potted" or embedded in this clear plastic, your pocket radio will be able to withstand rough treatment.

The plastic-enclosed radio can be tuned several ways. There probably will be no dial. A flat strip of metal which can be slid through a grooved slot or even a pin-like piece of metal may be used.

For less than you pay today for repairs on a small radio, you will be able to buy a new one. But a radio protected from shock and weather will not need to be replaced very often. It is more likely to be lost than damaged.

Dr. Brunetti's lipstick broadcaster is even smaller than his receiver. Instead of printed wire on a flat surface, the one-tube broadcasting unit has the circuits painted on the surface of the tube.

He uses hearing aid batteries and a standard portable microphone. A lip microphone may be most convenient for personal broadcasting.

Personal broadcasting will be like the

party line on a rural telephone, Dr. Brunetti explains. When you want to broadcast, you will tune in and see if the line is busy. The Federal Communications Commission, which has the job of controlling American broadcasting, has indicated that it will open the frequencies between 460 and 470 megacycles for this type of broadcast.

When an airplane crashes into a mountain in the future, a survivor may call for help and guide rescue parties with broadcasts from a station in his pocket. Today's radios aboard planes are generally destroyed or put out of order by a crash. The pocket unit, developed from radios shot out of guns in the proximity of a crash, will be more likely to survive a crash than humans.

Aid for auto wreck victims may be summoned by pocket radios; sportsmen and explorers can call for rescue parties with pocket broadcasting stations. Doctors will have personal pocket radios to summon them. Police will probably be among the first to utilize the small radio units.

Personal Broadcasting

Less urgent, but nonetheless convenient, will be your own, non-emergency use of personal broadcasting. If you get a flat tire on the way home from work, you can tell your wife to delay dinner. And there are countless other times when you can use broadcasting.

Even more important than tiny radios and personal broadcasting may be the revolution in radio and electronics manufacturing which will follow use of the "printed wire" technique and diminutive equipment being developed.

Cost Reduction

Printing wire circuits reduces the cost of wiring 30% to 60%, explains Dr. Brunetti. And wiring, he adds, is a big chunk of what you pay for a modern radio. By stenciling a circuit on a plate, a single worker can turn out perhaps 5,000 circuits for radios in a day. The same worker would probably be able to complete the conventional wiring on only 10 radios.

Many important electronic developments during and since the war have failed to come on the market as soon as the public had hoped. Part of the difficulty is the size of the units. This is particularly true of aviation equipment, and one answer may be sub-miniature tubes and printed wires. With the miles of wire printed and tiny tubes soldered to the flat circuits, greater use may be made of some



BROADCASTING AND LISTENING—Complete radio broadcasting station is held in the left hand of Dr. Cleo Brunetti of the National Bureau of Standards while a four-tube radio receiver is in his right.

important electronic developments.

In the proximity fuze, stencils over plates of steatite, a hard, dense ceramic material, were used in printed wire. Since then, experimenters at the Bureau of Standards have devised five more methods. In addition to the stencils and variations such as painting, other tested methods of applying the circuits are spraying, a chemical method adapted from the process used to silver mirrors, metal sputtering or evaporation, engraving, and electrophotography.

Steatite is only one of many materials which can be used as a base for the lines of a printed wire circuit. Any insulating surface will do the job. Electronic circuits can be printed on glass, porcelain, plastics, paper and many other materials.

Pocket radios can even be built into the pocket of the future, because circuits can be printed on cloth.

Reporting that the Bureau of Standards has been flooded by inquiries from industry since he displayed his tiny radio and broadcasting sets, Dr. Brunetti believes many commercial uses for printed wire are coming soon. Globe-Union, Inc., Milwaukee, Wis., holds some patents on the process which it helped develop for the proximity fuze, but much of the research on printed wire is being pat-

ented by the Bureau of Standards and will be available to any manufacturer. Some of the basic patents on the printed wire actually date back a century and are now available anyway, Dr. Brunetti reports.

With a receiver and broadcasting station in your pocket, you may soon be able to turn off a bad radio program and air your own program, thanks to tiny equipment devised to make shells explode when they would do the most damage to enemy planes.

Science News Letter, March 22, 1947

CHEMISTRY

Atomic Commission Revises Price List for Isotopes

► THE ATOMIC Energy Commission has revised its price list for the radioisotopes which it sells for scientific research. Some of the isotopes have dropped sharply in price while others are up, under a new system which charges on the basis of space occupied by the material instead of neutrons absorbed by the material.

The important radioisotope carbon 14 has been reduced from \$367 per milligram, the unit of measurement used in the sales, to \$50. Phosphorus 32 and iodine 131, other frequently used isotopes, remain the same price.

Under the new charges, radiogold goes up from \$7.36 to \$12, while the more expensive radiosilver drops from \$121.30 to \$33.

Reporting that 466 orders for the radioactive byproducts have been processed, the Commission said it is charging only a portion of the actual operational and overhead costs. The tiny research tools are produced at the uranium chain-reacting pile of the Clinton Laboratories in Oak Ridge, Tenn.

Science News Letter, March 22, 1947

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Do You Know?

Dry wines are made from grapes of high acid and moderate sugar content; sweet wines of grapes with high sugar content and moderately low acidity.

Beeswax and castor oil are the principal materials in many lipsticks; other oils and waxes are added to regulate hardness and oiliness.

The average octane number of premium-grade motor fuels sold in the United States in the summer of 1946 was 78.3, as compared with 74.9 the previous summer.

They are making wigs of nylon "hair" in England, a British trade journal states; these cost little more than wigs of human hair, although greater skill is required to turn out a perfect coiffure.

The talc in face powders provides good slip and texture; the zinc stearate or magnesium stearate provide binding; and barium sulfate or zinc oxide form the screen to hide blemishes.

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HOT FROM HEAVEN—Fragment of a shooting star is now in the Grand Canyon National Park's Museum.

ASTRONOMY

Hot Meteor Fragment Buries Itself in Earth

▶ A FRAGMENT of a "shooting star" buried itself in the earth near officials of the Grand Canyon National Park. They were observing the spectacular Giacobini-Zinner meteor shower the night of Oct. 9 when a meteor exploded overhead. A short time thereafter the specimen hit the ground in front of the group with a dull thud. It was still quite hot when dug out from the ground where it had become embedded. This meteorite, two inches long and an inch and a half wide, is a prized exhibit at the park's museum.

Science News Letter, March 22, 1947

PLANT PHYSIOLOGY

DDT Kills Bark Beetle Carriers of Elm Disease

▶ DDT HAS COME to the rescue of American elms, menaced by the misnamed Dutch elm disease from central New England to Chesapeake bay and westward to Ohio. It acts by killing the bark beetles that carry the disease fungus from sick trees to healthy ones.

Healthy trees, say entomologists of the U. S. Department of Agriculture, should be sprayed twice a season: first with a two per cent solution, then seventy-five days later with a one per cent solution. This will kill beetles before they can begin to feed on the twigs and thus inoculate the trees with the disease.

Science News Letter, March 22, 1947

CHEMISTRY

Synthesis of Pyrethrin Insecticide Foreseen

▶ SYNTHESIS of pyrethrin, an insecticide produced from Asiatic and East Indian flowering plants, may be possible in the near future, says Dr. William M. Hoskins, professor of entomology in the University of California College of Agriculture.

Laboratory production of pyrethrin would have important consequences, Dr. Hoskins says. He points out that pyrethrins now cost over \$25 per pound, and are still able to compete with other insecticides.

"Suppose synthetic pyrethrin could be made for half that price," he states. "It may even be possible through synthesis to create a pyrethrin that will be active for a much longer period."

While synthetic pyrethrin is not yet ready for use in agriculture, pyrethrin sprays, the potency of which has been increased by the addition of the chief alkaloid of black pepper, piperine, are now being used.

Science News Letter, March 22, 1947

CHEMISTRY

Three Percent of 300,000 Organic Compounds Useful

▶ ONLY three percent of the 300,000 known organic chemicals are currently useful, while the rest await development, Hoyt M. Corley of the chemical research and development department, Armour and Company, estimated recently.

Pointing out that this represents a challenge to chemists, Mr. Corley said that of the 9,000 now useful chemicals, only 5,000 are being manufactured in the United States.

Writing in *Chemical and Engineering News* (Feb. 17), the chemist explained that there are three reasons why so many chemicals have not been developed commercially.

The three reasons:

1. They have not been properly promoted.
2. Civilization has not progressed sufficiently to use them.
3. Production costs are prohibitive in relation to the functions performed.

"Civilization a hundred years from today will require many chemicals that are well known at the present time, but are not now of commercial importance," Mr. Corley predicted.

Science News Letter, March 22, 1947

WAR BUDGINS in LENSES and PRISMS

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plus \$8.00 tax—Total—\$48.00

COMPLETE OPTICS & METAL PARTS—Model M-3, 6 x 30 Binoculars. The Optics in this set are new, perfect or near-perfect. Prisms have new low reflection coating. Factory mounted Eye Piece and Objective Assemblies not coated. Metal Parts are perfect, new, ready for assembly. When finished, this will look like a regular factory job, except a name has been filed off a cover plate. No machining required. Bodies factory hinged and covered.
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Stock #833-Q—6 x 30 Metal Parts—\$12.00 Postpaid

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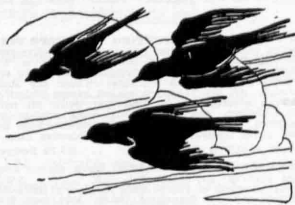
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Homeward-Bound Birds

▶ ABOUT this time of year we are apt to become acutely conscious of signs of the new spring. Someone sees a dandelion in bloom in a sheltered spot. Then someone sees a robin. Then suddenly the whole town is full of robins, cheerfully noisy as a veterans' convention.

Actually, of course, other birds get here before the robins do. But they are for the most part less conspicuous, less assertive in their songs, rather more inclined to be shy of man and his works. The gregarious robin, at home on any square yard of sod that has a worm under it, makes the arrival of spring official.

Early songs of robins and other birds are not sweet serenades of their mates, as is sometimes romantically assumed. The first wave of migrating songbirds,

with most species, consists entirely of males, so there just aren't any mates, present or prospective, around to be serenaded.

What happens is that each of the early-arriving males seeks out what looks like a good food-gathering area, perches on a conspicuous limb or stump in it, and proceeds to file claim by singing as loudly as possible. If a rival claimant appears, the first-comer goes after him with a scuffling whirl of wings, until he thinks better of it and goes away.

After the hunting-grounds have thus been parcelled out and differences in claims adjusted by many a minor skirmish, the wave of migrating females comes in. Just how much rivalry there is among them for the male that looks as if he might be the best provider is uncertain. It doesn't matter, really; before long every male has his mate and every female her nesting site.

Songs of birds in spring, therefore, are not at all romantic. They are as solidly pragmatic as the arrangements of European immigrants, who would often leave their womenfolk in the Old Country until they had found a job or set up a business, and got hold of the makings of a home.

One piece of romantic nonsense the returning birds should surely drive out of our heads: that notion that "when the swallows homeward fly" they are heading southward. Swallows, and all migrating birds, fly homeward when their course is towards the north. Home is where the nest is.

Science News Letter, March 22, 1947

AGRICULTURE

Liming Soil Helps Reduce Crop Damage From Fluorine

▶ DAMAGE TO CROPS from fluorine, a farming hazard that has arisen since the large-scale introduction of this poisonous element into certain industries during the war, can be materially reduced by heavily liming the soil, experiments at the New Jersey Agricultural Experiment station show.

In the tests, wheat and tomato plants were grown in pots of soil to which various amounts of fluorine had been added. Fluorine damage to plants in soil lots that had also been well limed was much less than it was in unlimed, acid soils. On this basis, the scientists recommend application of lime and superphosphate to soils where industrial pollution with fluorine is a factor.

Science News Letter, March 22, 1947

CHEMISTRY

Solvent Extraction Makes Purer Cottonseed Oil

▶ PURER, lighter-colored cottonseed oil and lighter-colored cottonseed meal that is probably better both for industrial purposes and for feeding livestock and poultry result from a new extraction process developed in New Orleans at the Southern Regional Research Laboratory of the U. S. Department of Agriculture. It should bring about better prices for those two important co-products of the cotton industry.

Oil extraction as now practised involves first heating, then pressing the cottonseed, either in huge hydraulic presses or in more modern continuous-process screw presses. Any kind of pressing process leaves about 6% of the oil in the seed meal, and also releases pigment from certain gland-cells in the seed into both oil and meal, making them darker than necessary.

Researchers at the laboratory discovered that if the seed is finely flaked and then shaken violently in a solvent mixture a three-fold separation takes place: the oil is taken up by the solvent, the oil-free meal settles to the bottom, and the pigment-containing gland-cells float to the top where they may be skimmed off.

As frequently happens in research, this industrially useful discovery was not made as a result of direct effort to improve the quality of cottonseed oil and meal, but is a by-product of scientific curiosity about the cottonseed pigments. In discovering how to get sufficient quantities of the pigments out of the seed for analysis, the chemists hit upon a better way to obtain high-quality oil and meal.

The coloring matter in the seed, they discovered, is not the one pigment which has been known by the name of gossypol, but a complex of at least 11 related pigments.

Science News Letter, March 22, 1947

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Books of the Week

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ANIMAL HIDE AND SEEK—Dahlov Ipcar—W. R. Scott, 40 p., illus., paper, \$1.50. Introduction to animal camouflage for the very young (3-7) with familiar animals in simple woody settings.

ANYWHERE IN THE WORLD: The Story of Plant and Animal Adaptation—Irma E. Webber—W. R. Scott, 64 p., illus., paper, \$1.50. Simply told, this account of how animals and plants adjust themselves to climates is brightly illustrated for children 7-11 years old.

BOVINE MASTITIS—Ralph B. Little and Wayne N. Plastridge, eds.—McGraw-Hill, 546 p., illus., \$7. A symposium by eleven experts covering the diagnosis, bacteriology, pathology, serology, etiology, control, treatment and public health significance of under infections in dairy herds.

EINSTEIN: HIS LIFE AND TIMES—Philip Frank—Knopf, 298 p., \$4.50. This fascinating biography of a great physicist endeavors to make his discoveries and formulations as understandable to the layman as is possible; his formula relating energy and mass is basic to the atomic bomb.

ELECTRONIC CONTROL HANDBOOK—Ralph R. Batcher and William Moulic—Caldwell-Clements, 344 p., illus., \$4.50. A well-indexed reference book on the fundamentals of electronic control principles as used in industry to assist in appraising the value of and specifying these devices.

ELECTRONIC ENGINEERING HANDBOOK—Ralph R. Batcher and William Moulic—Caldwell-Clements, 456 p., illus., \$4.50. A working tool for engineers interested in electronic applications in the industrial and communications fields, it covers every important circuit and essential application.

HERE IS TELEVISION: Your Window to the World—Thomas Hutchinson—Hastings House, 366 p., illus., \$4. With emphasis on program and production technique, a thorough account of the industry is presented, including a survey of jobs in this field.

AN INTRODUCTION TO THE GENETICS OF HABROBRACON JUGLANDIS ASHMEAD—Albert Martin Jr.—Hobson Bk. Press, 204 p., \$3.50. A clear account of the results of investigations thus far made is presented, including a complete list of extant and discarded mutant types of this parasitic wasp.

LAND OF PLENTY—Walter Dorwin Teague—Harcourt, 320 p., \$3. Describing the new sources of power at our disposal, the new alloys and synthetic materials for our use, the health and educational services at our command, this summary of possibilities for the future re-emphasizes belief in the American system of individual initiative.

LOBUND REPORTS, No. 1—James A. Reyniers, ed.—Univ. of Notre Dame, 120 p., paper \$1, cloth \$1.50. This first of a series of publications to be put out by the Laboratories of Bacteriology, University of Notre Dame, discusses the rearing of germ-free albino rats and germ-free life applied to nutrition studies. The laboratories are en-

gaged in the study of germ-free life.

MALAYA: OUTLINE OF A COLONY—Victor Purcell—Nelson, 144 p., illus., \$2.50. A spirited account of the country's dramatic past, brief accounts of its economic position in the world, and a balance sheet of British policy and achievement provide a background for a discussion of its future.

MEDICINE IN THE CHANGING ORDER—Report of the New York Academy of Medicine—Commonwealth Fund, 240 p., \$2. This study of the New York Academy of Medicine's Committee on Medicine and the Changing Order represents a critical examination of every phase of the current medical situation together with thoughtful conclusions as to remedies for present inadequacies.

POINTERS FOR PARENTS—Reinhard V. Lozier—Lippincott, 141 p., illus., \$2. A commonsense book teaching parents what to do for their children and helping them record growth and development. Because of its brief, to-the-point instructions, it can help solve problems at once.

PRACTICAL PHYSIOLOGICAL CHEMISTRY—Hawk, Oser, and Summerson—Blakiston, 12th ed., 1323 p., illus., \$10. Completely rewritten, this useful textbook includes new phases of medical biochemistry and an abundance of expository methodological and reference material; recent advances in medicine are presented in the light of clinical applications.

SCIENCE YEARBOOK OF 1947—J. D. Ratcliff, ed., Doubleday, 247 p., \$2.50. A series of short essays here reprinted summarize scientific events in physics, chemistry, medicine, agriculture, aviation, etc., in 1946.

SOCIAL WORK YEARBOOK OF 1947—Russell H. Kurtz, ed.—Russell Sage Foundation, 712 p., \$3.50. This description of organized activities in social work and in related fields, alphabetically arranged, covers topics ranging from the administration of social agencies, juvenile behavior problems, labor and social work, to veterans benefits and vocational rehabilitation; each section has a bibliography for further reference.

THE STORY OF WOOL—William F. Leggett—Chemical Pub., 300 p., \$5. This historical background for one of the top-ranking industries in the world by providing a deeper understanding of the habits of ancient craftsmen should prove an incentive for individual textile artistry.

A SURGEON'S DOMAIN—Bertram M. Bernheim—Norton—253 p., \$3. An informal frank description of problems and practices, with references to the complexities of hospital administration and the relationship between surgeon-teacher and his students.

TWO BLADES OF GRASS—T. Swann Harding—Univ. of Oklahoma Press, 352 p., \$3.50. This history of scientific development in the U. S. Department of Agriculture is an absorbing account of the search for better grains, fruits, livestock, and methods of soil and forest conservation, for control of diseases in plants and animals, and for addi-

tional economic uses of farm products and by-products.

UNESCO: ITS PURPOSE AND ITS PHILOSOPHY—Julian Huxley—Public Affairs Press, 62 p., paper, \$1. The background and program of UNESCO interpreted by the Director General of that organization.

YALE UNIVERSITY PUBLICATIONS IN ANTHROPOLOGY, Nos. 35 and 36, Excavations in the Cuenca Region, Ecuador—Wendell C. Bennett—British Guiana Archaeology to 1945—Cornelius Osgood—Yale Univ. Press, 150 p., illus., paper, \$2. Sherds from the excavation in Ecuador are described in detail and a history of the previous work in Guiana is summarized as a background for future investigations.

Science News Letter, March 22, 1947

PHYSICS

Voice Can Be "Watched" While Being Recorded

➤ AN OSCILLOSCOPE figures in the invention offered by Barry Shipman of Pasadena and Robert H. Guhl of Van Nuys, Calif., for patent 2,416,353. It is built into the cabinet of a phonographic recorder, so that the voice of a singer or the tones of an instrument can be "watched" while the record is being made.

Science News Letter, March 22, 1947



Photo Courtesy Ohio State Univ.

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• New Machines and Gadgets •

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✿ **BABY BASKET**, made of a single piece of transparent plastic, keeps the infant in sight at all times. With end handles, it is easily carried, and the high sides of the basket protect the baby from drafts.

Science News Letter, March 22, 1947

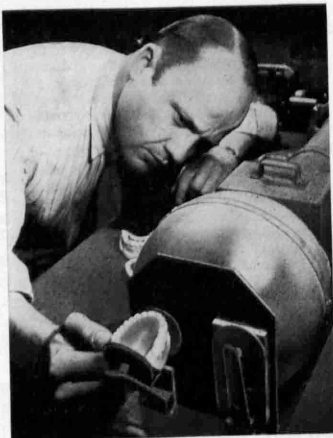
✿ **TWO-EYE viewer** of two-inch square photographic slides enables both eyes to be used in examining a single transparency, and gives three-dimensional effect. It somewhat resembles ordinary binoculars without forward lenses, but with a transparent front and a slot for the film.

Science News Letter, March 22, 1947

✿ **FIRE EXTINGUISHER** for early flames, a carbon dioxide apparatus weighing only 12 pounds, has a trigger release opened by grasping two handles like those on pliers. An elongated horn at right angles to the top directs and concentrates the discharged gas on the flame.

Science News Letter, March 22, 1947

✿ **COLOR-MEASURING instrument**, a recording spectrophotometer, is claimed by the makers to be able to distinguish many billions of colors. It separates the elementary colors making up the hue in



in the object under examination, determining the amount of each. The picture shows one use in matching new teeth with plates already in use.

Science News Letter, March 22, 1947

✿ **CAN-OPENER**, wall-type, with a hinge by which it can be folded back out

of the way when not in use, makes a clean shearing cut by means of a plain roller without sharp cutters or cutting wheels. This chromium-plated steel tool opens cans of any size by shearing the lid directly under the bead.

Science News Letter, March 22, 1947

✿ **ADHESIVE**, for bonding wood in forming laminated beams and other structures, is especially useful where electronic heating methods are available. It does not spark when electrodes come in contact with the squeeze-out of glue or with the glue line itself. It makes radio-frequency bonding methods more practical.

Science News Letter, March 22, 1947

✿ **DUST COLLECTOR**, portable-type, has a baffle plate beneath its filter tubes that causes heavy dust to be deposited at the point of intake, before the air enters its tubular filters. In this it differs from most dust collectors of the tubular filter type which rely solely on the filters to remove the dust.

Science News Letter, March 22, 1947

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