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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • FEBRUARY 10, 1945

Alaska Highway

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A SCIENCE SERVICE PUBLICATION

DENTISTRY

High Altitude Toothache

Is caused by a disturbance of circulation in the pulp of the tooth; root canal treatment or extraction only two advisable remedies.

➤ THE CAUSE of toothache at high altitudes, which impairs the flying efficiency of almost two out of every 100 cadets and officers given altitude training, is a disturbance of circulation in the pulp of the tooth which prevents equalization of pressures during change in altitude.

Studies showing this are reported by Dr. Balint Orban, of the Chicago College of Dental Surgery, Loyola University, and Capt. Beryl T. Ritchey, AAF, assistant to the Dental Surgeon (*Journal, American Dental Association,* Feb. 1).

Their studies were made on 250 young men referred to the dental clinic from an altitude training unit and on 75 teeth extracted and examined microscopically. The men were sent to the clinic because of toothache during simulated high altitude conditions in the decompression chamber.

Of the 75 teeth, 16 had swollen pulps, 17 had acute inflammation of the pulp, 15 chronic inflammation of the pulp and seven were teeth with dead pulps. The pulp is the soft tissue inside a tooth which contains the nerves and blood vessels.

Teeth with normal pulps, the dentists state, will not hurt under decompression during ascent to high altitudes. This is true, they found, whether the teeth are intact, carious (decayed) or filled.

High altitude toothache in teeth with pulp that is still living comes almost invariably during ascent. On the average, the pain starts at 11,000 feet if the tooth has edema (swelling) of the pulp; at 7,000 feet if there is acute inflammation; and at 17,000 feet if there is chronic inflammation.

Teeth with nonvital, or dead, pulps hurt only exceptionally and in such cases usually during descent.

Sudden sharp pain at relatively low altitudes is a sign of bubble formation in the pathologically changed pulp.

Only two methods of treatment for high altitude toothache seem advisable, once the diagnosis has been established, the dentists find. These are root canal treatment or extraction. As an emergency measure, treatment with zinc oxide and eugenol may be given. This will prevent toothache during ascent, but for flying personnel it is advisable only as an emergency measure because it does not remove the source of the toothache, which may return at a later and dangerous time.

For prevention, the dentists recommend careful cavity preparation with the use of cavity varnish in every cavity and, in deep cavities, the addition of an oxyphosphate cement base under amalgam fillings.

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ELECTRONICS

"Starlight" Tube

New super-sensitive small electronic tube measures electricity equivalent to the light of a star many million-million miles away.

➤ A "STARLIGHT" tube, it is called, a new super-sensitive electronic tube smaller than a 25-watt incandescent light bulb, can be used to measure accurately the feeble quantity of electricity equivalent to the light of a star many million-million miles away. It has, however, very practical essential wartime uses in the electro-chemical analysis of metals such as steel, and the detection of impurities in high explosive compounds.

The new tube and its development were described at the meeting in New York of the Institute of Radio Engineers by William A. Hayes of the Westinghouse Electric & Manufacturing Co., who is responsible for its present development.

"The minimum amount of electric current which the tube can measure," he said, "one one-hundred-trillionth (1/100,000,000,000,000) of the electric energy in the light from an average home reading lamp, actually is less than the minute electric current in the dimmest starlight."

When astronomers seek information concerning changes in a planet's direction, speed or other characteristics, he explained, they hitch the tube, which is attached to a photoelectric cell, to the "eye" end of an observatory telescope. On the basis of the starlight readings, the distance between the earth and the stars is determined by trigonometric computation.

The sensitivity of the tube, which must be operated in total darkness to keep ordinary daylight from energizing the grid, is derived from its unorthodox design and construction, he continued. Glass "pants-legs" are tailored around the stiff metal wires which support the tube's internal structure to prevent stray electrons from getting lost. Functioning like a lightning rod, a tiny tungsten wire is spot-welded inside the tube and pressed against the tube's side to catch unwanted electric charges that might affect its accuracy.

A simple electronic tube contains a wire filament that shakes loose electrons when heated, a metallic mesh called a grid that acts as a control gate through which electrons must pass, and a plate that collects the electrons. In the new starlight tube the roles of the plate and the grid are interchanged; the grid functions as the plate and the plate as the grid.

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ORDNANCE

Rubber Instead of Springs In Artillery Shell Fuzes

➤ SIMPLIFICATION of artillery shell fuzes is the objective of the invention protected by patent 2,367,246, granted to W. E. Thibodeau of Cleveland and G. J. Kessenich of Madison, Wis. In most such fuzes, the striker is prevented from coming into contact with the primer charge until after firing by a mechanical barrier held in place by springs. When the shell is spun by the gun's rifling, centrifugal action forces the springs back and permits the arming of the fuze. The present invention substitutes a collar or hollow cylinder of soft rubber for the more complicated weight-and-spring arrangement. The rubber itself is deformed by the centrifugal action, permitting the free passage of the striker.

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INVENTION

25 Problems Need Solution

The Navy has sent out an urgent call for solutions to such problems as dropping articles from planes without use of parachute.

➤ HAVE YOU a good method for welding thin aluminum sheet? Or a fungicide that will make tents and tarpaulins rotproof in the humid tropics? Or some way to prevent cracks from spreading in steel structures, without having to use a lot of rivets and caulking?

If you have, the Navy wants to know about it. It has asked the National Inventors Council to issue a general call for solutions to 25 problems that stand as challenges to Yankee ingenuity. C. F. Kettering, chairman of the Council, has passed on the word to Americans at large, confident that the right answers will not be slow in coming up.

Some of the problems, though by no means easy, do not necessarily need specialized technical training for their solution, so much as native skill in devising things. Included in this class might be the call for some way of dropping things from planes without use of parachutes—possibly some inexpensive and expendable pneumatic cushioning arrangement. Another would be a simple, easily-run-up radio antenna about 300 feet high, requiring no steeple-jack work for its erection. Still another would be a non-slipping shoe sole for use on the wet deck of a sharply rolling ship.

One group of problems is as old as seafaring itself: the job of being on or in the water and still not getting wet. Modern angles of this old difficulty include waterproofing the openings through which small shafts connect the "works" within tight radio cabinets, generators, etc., with outside cranks and control knobs; waterproof jacks for microphones and headphones; a durable plastic-impregnated tent fabric, waterproof, lightproof, weighing less than six ounces per square foot.

Sailing at night has always involved the necessity for guiding and warning lights. Accordingly, the list includes a call for a simple, lightweight beach marker light; an improved drum-type lens that spreads a flat circle of light in all directions; a narrow-beam range light that will replace the present two-lamp installations.

Several of the desired inventions are jobs for men with professional training and experience in the fields of electrical and electronic engineering. Such are a polyphase AC motor of improved torque properties; a small DC motor without commutator, slip ring or other loose, noise-making parts; a compact, rugged, expendable mechanical device to permit successive closures of up to eight electrical circuits with a time interval between closures of about 0.2 to 0.3 seconds; a precision twin-triode vacuum tube resembling the present 6SN7 type but with improvements on it.

Concern for the safety and health of Navy men, both afloat and ashore, are reflected in several of the problems. For example the Navy wants a fire-extinguishing liquid that will work as well as the now widely used carbon tetrachloride, without the latter's distressing trick of splitting into poisonous phosgene gas when it strikes hot metal. Another requirement is for a device that will take continuous samples of the gases in enclosed spaces, such as the bilges of boats, to detect accumulations of dangerous gasoline vapor. Still another is an efficient knapsack sprayer for mosquito control work ashore.

If you have any inventions or definite ideas along these lines, or wish a list of the 25 needed inventions giving fuller details, write to the National Inventors Council, Department of Commerce, Washington 25, D. C.

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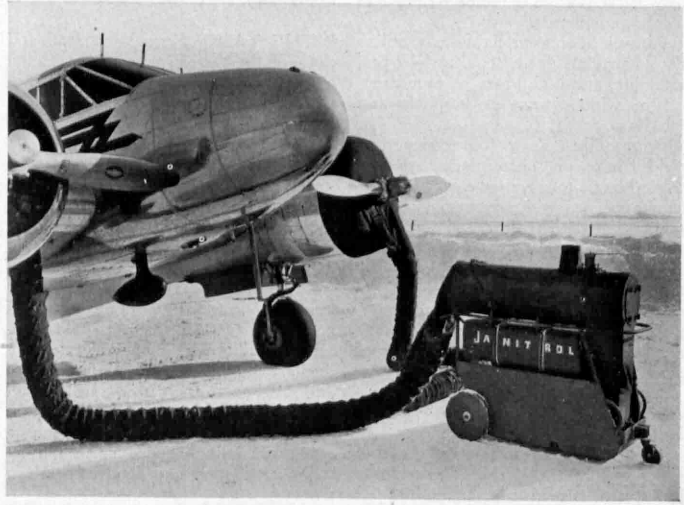
ENGINEERING

Portable Plane Heaters Used for Many Purposes

➤ SOME COLD MORNING next winter when you find your car frozen up, you may be able to call the garage and have them bring out a portable heater to pre-heat it so you can get started. The heater they'll use will be similar to the one now being used to warm up aircraft engines in Alaska today. The need for safe pre-heating of airplane engines, cabins, instruments and windshields in climates where temperatures as low as 50 degrees below zero Fahrenheit are not uncommon was responsible for the development of a new unit that blasts out heat.

The portable heater, burning gasoline,



PORTABLE HEATER—Do you have trouble starting your car on an icy morning? A Toledo manufacturer, Surface Combustion Company, has solved the problem for airplanes with this heater which warms both engine and cabin at the same time.

kerosene or oil, employs the same "whirling flame" principle as the aircraft heater installed in most military planes using this combustion type heater. It was developed by the Surface Combustion Company in Toledo.

Frozen railroad switches, responsible for many train delays during a cold spell, could be quickly thawed out with one of the heaters which the Army Air Forces now use. Owners of truck and bus fleets will soon be able to acquire units both to pre-heat cold equipment before starting and for use on the road to free any equipment that becomes ice or snow-bound.

Military uses other than aviation include warming hospital tents, headquarters tents and barracks. In the hot, moist tropical climates the armed-forces use the heater to dry out workshops, keeping delicate airplane instruments free of damage from moisture while they are being serviced on the ground.

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"While adequate food, clothing, shelter, and soap are the basic requirements for halting the spread of China's diseases and sickness," the report states, "the Chinese Government estimates a need for 74,000 tons of medical supplies and equipment and for the services of several hundred foreign technicians. For these purposes China has requested from UNRRA $66,004,000 in imported supplies and services during the emergency period, while Chinese expenditures for these purposes are estimated at $246,515,000, in Chinese currency."

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CHEMISTRY

New Phosphate Glass

➤ VOLUME production of aluminum metaphosphate planned for the postwar era will bring into commercial availability a useful glass.

From aluminum metaphosphate can be manufactured glass which transmits a substantially greater amount of ultraviolet light such as aids the formation of vitamin D.

Aluminum metaphosphate's use in the making of glass represents a radical departure from such bases as lead, well-known to the ancients, and from the more recent combination of sand, soda ash and lime. Aluminum metaphosphate is derived by Monsanto Chemical Company largely from aluminum and elemental phosphorus.

Postwar fluorescent lights may utilize phosphate glass due to its ultraviolet permeability, and it also may be found useful in windowpanes of hospitals and solariums.

Because they show less tendency to yield a haze, phosphate glasses are considered likely to solve some optical problems associated with astronomy, photography and related fields.

Phosphate glasses show improved weather resistance, improved color control, improved melting and working characteristics and improved resistance to some acids. Used in insulators, they reduce loss of electrical current as compared with other glass insulators.

A companion metaphosphate has properties that suggest its ultimate use as a heat insulator. Its volume increases 500-fold under high temperatures. Another metaphosphate, also ready for volume production, is used in ceramics.

Monsanto's Phosphate Division has produced a new white paint pigment, called tetra lead pyrophosphate, which in light-reflecting tests is superior to the usual titanium pigment. Another product is ferric orthophosphate, which can be used in flour and cereals to give them more than twice their normal amounts of iron.

Each of these products is based on elemental phosphorus, which burns fiercely on exposure to air, and is widely used in incendiary bombs and mortar shells. Monsanto produces elemental phosphorus in a plant near Columbia, Tenn. Its current output is about ten times that of the entire nation during World War I.

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NUTRITION

Best Aid for China Is Helping Her to Produce

➤ THE TASK of providing food and clothing for the direct relief of China is too huge for any agency such as UNRRA or group of agencies, according to a report of the National Planning Association recently made public.

Although a stopgap will be needed for liberated areas as the Japanese are driven out, the only way to help China feed her millions is to help her restore and improve her own agricultural production.

Large quantities of agricultural equipment and supplies are needed, the report indicates. Provision of trained scientific personnel who can conduct experimental work and pass their knowledge and skills on to the Chinese will be important. Of great importance will be supplies and assistance for repairing dikes, reclaiming flooded areas and installing irrigation and flood control systems.

China also needs UNRAA's help in combatting epidemics, the report indicates, although even with this help it is not possible to achieve an "adequate" health program.

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TECHNOLOGY

Ample Oil Supply

Is assured by science and technology through improved production and refining processes. Coal for gasoline is plentiful.

➤ SCIENCE and technology assure an ample supply of oil for many years to come because they have made possible a greater recovery of crude oil from wells, refining increased quantities of gasoline and other derivatives from the crude, and successful methods of obtaining oil, gasoline and chemicals from coal, lignite and natural gas. This is the opinion of Robert E. Wilson, president of Pan American Petroleum and Transport Company (*Mining and Metallurgy,* January).

These important developments, he states, have come about "by improved technology resulting from research and its application to every branch of the industry. . . . This technology has not merely added to, but has, in effect, multiplied our available petroleum reserves. Today technology has made it possible to produce all essential oil products, that is, lubricating oils, gasoline, heating oils, and wax from coal at costs which are not unreasonable or out of line with values." The coal is plentiful, he says.

The amount of oil obtained from wells was for many years only what resulted from natural flow or obtained by pumping.

"Today we can flush the oil out of the sand with a water drive," he states. "As oil becomes more valuable and technology becomes more improved the percentage recovery will go up."

By water pressure from 60% to 70% of the oils in the sands are obtained; by the earlier method, with pumps alone, only about 20% was recovered.

Science and technology have made it possible to convert heavy fuel oil into gasoline and other oil products, Mr. Wilson says, and we are approaching the time when there will be a decrease of perhaps 15% in the yield of heavy fuel oil from crude because heavy fuel oil is now more valuable for making gasoline.

The United States has normally between 65% and 70% of the motor vehicles in the world, he declares, and produces and refines between 65% and 70% of the world's petroleum. We "cannot expect to produce indefinitely 65% of the world's oil," he adds, "We must look more and more to foreign sources of oil."

"The really rich areas in oil, as proven by drilling," explains Mr. Wilson, "are in the large basins alternately lifted and depressed between major continents—the Caribbean area, including our Gulf Coast, Venezuela, and Colombia; the great area between Europe and Asia, which has the tremendous reserves of Arabia and Iran; the intercontinental area of the Netherlands Indies between the continents of Australia and Asia; and finally, the area around the Arctic Ocean, in northern Russia and around Alaska, which may prove a rich area but which, because of physical difficulties, has not as yet been explored."

The Middle East fields in Arabia, he says, are particularly rich. Test drilling "indicates that the Middle Eastern fields are incomparably richer than those in this country."

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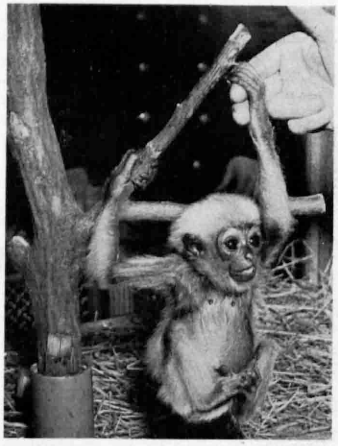
MEDICINE

Ambassadors Helped in Fight to Check Typhus

➤ AMBASSADORS joined with scientists and Army and Navy Medical and Sanitary Corps officers in the fight against typhus fever, latest awards of the United States of America Typhus Commission Medal show.

The Honorable Alexander Comstock Kirk, U. S. Ambassador to Italy, and the Honorable Laurence A. Steinhardt, U. S. Ambassador to Turkey, are among the recipients of this award announced by the War Department. The awards were made by the War Department by the direction of the President.

Mr. Kirk, as Minister to Egypt during the period from Jan. 7, 1943, to May 1, 1944, took great personal interest in the activities of the commission. His constant support of its program "contributed materially to the success of the commission's investigations and control of typhus fever in the Middle East," his citation "for exceptionally meritorious service" states.



4 MONTHS OLD—Barbara, the first hybrid gibbon ever born in captivity, gets her pablum, milk and orange juice like any baby. She is fed with a bottle on a three-hour schedule, while her admiring public looks on. Between feedings she kicks, reaches for toys and sleeps and sucks her thumb. Barbara has been separated from her mother because the mother (who had never before had a baby) did not care for her properly. (See SNL, Oct. 14, Nov. 18).

Mr. Steinhardt, also cited for "exceptionally meritorious service," besides his active cooperation with the commission and support of its efforts to control typhus fever in Turkey, "personally made possible a cooperative project with the Turkish Army Medical Department which advanced the appreciation of American medicine in Turkey and fostered scientific understanding and good will."

The vaccine used to protect American fighting forces against typhus fever and DDT, the powerful killer of lice which spread typhus, have been justly acclaimed, especially for their roles in the control of the epidemic in Naples last year. Besides these weapons, the fight against typhus required organization and administration and laboratory studies. Meritorious service along these lines was given by others receiving the Typhus Commission Medal. They are: Capt. Thomas J. Carter, M.C., U.S.N., Chief, Preventive Medicine Division, Bureau of Medicine and Surgery, Navy Department, whose home address is 2910 North 24th St., Arlington, Va.; Col. Harry

Poltz, M.C., A.U.S., 671 East 17th St., Brooklyn, N. Y.; Lt. Col. John Crayton Snyder, M.C., A.U.S., 535 East 72nd St., New York City; Lt. Comdr. William B. McAllister, Jr., M.C., U.S.N.R., 2385 Euclid Heights Blvd., Cleveland, Ohio; Maj. Charles M. Wheeler, Sanitary Corps, A.U.S., 200 West Imperial Highway, Brea, Calif.; Maj. Theodore E. Woodward, M.C., A.U.S., 1 Park Ave., Westminister, Md.; Lt. Comdr. Andrew Yeomans, M.C., U.S.N.R., 38 Webster Place, Brookline, Mass.; Capt. Byron L. Bennett, Sanitary Corps, A.U.S., 14 Autumn St., Boston, Mass.

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RESOURCES

More Tungsten

➤ TUNGSTEN AND molybdenum, rivals for favor in the war-essential rare-metals family, are now available in sufficient quantities to meet the most important needs, among which are the 15,000 types of items used mostly in electric lamps and electronic tubes, according to the lamp division of the Westinghouse Electric & Manufacturing Company, one of the largest American producers of pure tungsten for electrical uses from imported wolframite ore. Its production of tungsten from the imported ore is now 16 times as great as in prewar years, and the production of molybdenum, from an American ore, has increased to about the same extent.

In prewar years tungsten ore came principally from countries now wholly or partly under Japanese control. Chinese ore is reaching the United States, but it has to be brought by aircraft transport into India and shipped from there by boat. The United States is one of the principal molybdenum mining and smelting countries.

For use in electronic tubes and lamps, both tungsten and molybdenum must be in a high state of purity. The processing of both requires intricate and precise handling. The metals are reduced to powder form and later pressed into ingots strong enough to be drawn into very fine wire or to be formed into rods and sheets. Both these metals have high melting points, both have electrical conductivity about one-third that of copper, and both compare favorably with the more expensive metals, platinum and tantalum, in their ability to resist corrosion.

Tungsten is slightly superior to molybdenum in some respects, but it is limited as to size and form and weighs twice as much. It is one of the heaviest of all metals. It has the highest melting point of all. High-speed cutting tools are approximately 20% tungsten, and can be used on a lathe until red hot without losing hardness. Tungsten alloys, particularly steel alloys, are used extensively in many types of machines and especially in war munitions.

Molybdenum is a silvery white metal with a high melting point, and is used extensively in steel alloys to increase tensile strength, as well as in electric lamps and electronic tubes. It is also used in high-speed cutting tools as a substitute for tungsten. In steel alloys it is particularly valuable in protecting against corrosion, and especially against sulfur corrosion. It is called indispensable in vacuum tubes and all other electric equipment where high conductivity, great strength and rigidity at high temperatures are required.

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CHEMISTRY

Synthetic Rubber Now Used For Ship-Bottom Paints

➤ SYNTHETIC rubber now can replace natural rubber in another field—in the production of chlorinated rubber for ship-bottom paints, anti-fouling paints, and non-inflammable paints. Chlorinated synthetic rubber can be used also in the preparation of sand-core binders for molding operations, adhesives, and other products. The new synthetic chlorinated rubber is a development of the Goodyear Tire and Rubber Company.

The chlorination of natural rubber is carried on at fairly low temperatures, the rubber being dissolved in carbon tetrachloride and chlorine gas passed through the solution. The result is the formation of a new molecule that might be called "natural rubber chloride."

The chlorination of standard GR-S rubber can be carried out only at high temperatures. Catalysts were developed to lower the temperature but difficulty was experienced in getting rid of the catalysts. Therefore it was found necessary to develop a new type of synthetic rubber for chlorination. This is the new product.

The new chlorinated synthetic rubber is a creamy white powder containing from 60% to 70% chlorine. It is equal to the natural rubber product in every way, it is claimed. It is soluble in all aromatic hydrocarbons, including benzene and toluene, and also in esters like ethyl acetate and in chlorinated hydrocarbons. It is noninflammable, is resistant to both acids and alkalis and has excellent anti-corrosion qualities.

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ARABIAN ORYX—The first of its kind ever to be at the zoo in Washington, this oryx was presented by James M. Landis of the Foreign Economic Mission (See SNL, Dec. 16). The animal has large hoofs for walking on the sand.

INVENTION

New Grenade Thrower Works Like a Slingshot

➤ PROBABLY every G. I. now in combat used, as one of the earliest of his boyhood missile weapons, a rubber-band "slingshot" or catapult. He will be given a chance to use the same weapon again, on a larger scale and "for keeps," if the device on which Brooks Walker of Piedmont, Calif., has taken out patent 2,367,249 is made part of his equipment.

The invention consists of a pair of long, stout rubber bands, with stirrups to fit over the soldier's feet and a cup-like holder in the middle to take a grenade instead of the old-time pebble or marble. Lying on his back, the soldier hauls back on the holder with both hands until it is nearly up to his chin, then lets go.

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ASTRONOMY

Double White Dwarf

Only double star known to have white dwarfs for both of its components is probably only 1/1,600 as luminous as the sun.

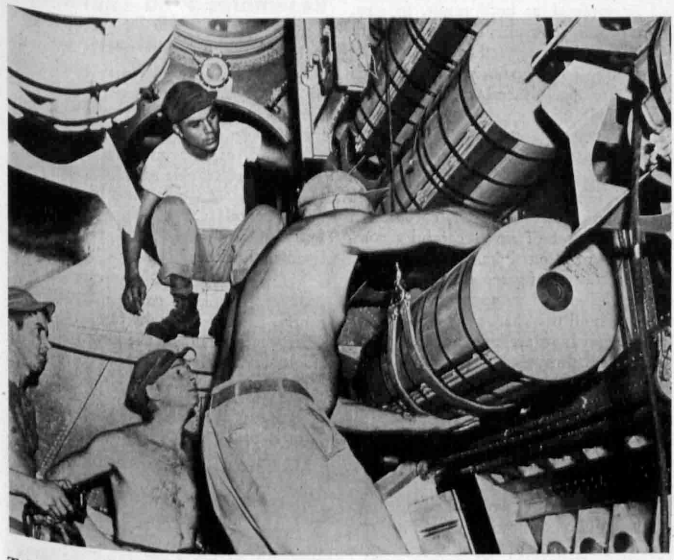
➤ THE ONLY double star known to have white dwarfs for both of its components, recently discovered by Dr. W. J. Luyten of the University of Minnesota, is probably only 1/1,600 as luminous as the sun. The density of these two stars is about 25 tons per cubic inch, Dr. Luyten reports (*Science*, Jan. 26).

"This new double white dwarf seems destined to play an important role in our search for knowledge concerning the white dwarfs," states Dr. Luyten. These freak stars have a high temperature, yet are so faint, in proportion to their distances, that their diameters are thought to be about the size of one of the planets and their average density incredibly large.

The two components of LDS 275, located in the southern constellation of Antlia, nearly 50 degrees due south of the bright star Regulus in Leo, appear to be so nearly identical in color and luminosity that it is safe to assume that their masses are also virtually equal, Dr. Luyten reports. In all other binaries involving a white dwarf the ratio of the masses must also be known since the two components are very dissimilar.

Both dwarfs are white or blue in color, and seem to have a diameter smaller than that of the earth. If they are of normal mass, about equal to that of the sun, their density would be of the order of one million times that of water, or about 25 tons per cubic inch, Dr. Luyten estimates.

The two stars appear to be about four seconds of arc apart, which means that they are probably fifty times as far apart as the sun and the earth, if his guess as to their distance is correct. It probably takes 250 years for the two to make one complete revolution in their orbit.



TOKYO RAID—Ground crewmen hoist a 500-lb. cluster of Chemical Warfare Service M69 flaming jelly bombs into the bomb bay of a B-29 Superfort as planes of the 21st Bomber Command prepare for a raid on the Japanese capital. Official U. S. Army Air Forces photograph.

The existence of white dwarfs was not discovered until the beginning of the century. About 11 double stars are known to contain one white dwarf, and a total of 70 white dwarfs have now been discovered.

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GENERAL SCIENCE

Committee Set Up for Future Standards Work

➤ FUTURE plans for standards work will be formulated with the assistance of a committee of eight industrial executives appointed by the Secretary of Commerce to make recommendations to him in regard to the relative roles that should be played by government and industry in standards activities. Charles E. Wilson, president of the General Electric Company, has been made chairman of the group.

The other members of the committee are Frederick M. Feiker, dean of engineering, George Washington University; Clarence Francis, General Foods Corporation; Ephraim Freedman, R. H. Macy and Co.; Frank B. Jewett, National Academy of Sciences; William B. Warner, McCall Corporation; Arthur D. Whiteside, Dunn and Bradstreet; and R. E. Zimmerman, U. S. Steel Corporation.

The appointment of this committee is one of the results of a conference of 50 business leaders held recently in New York at the invitation of the Secretary of Commerce at which the needs for standards and the work of the National Bureau of Standards and of the American Standards Association were discussed. The conference recommended that industry should provide a strong leadership in the development of national standards and that this should be done in full cooperation with the government.

The conference noted with approval steps already taken by the American Standards Association to broaden the scope of its work to enable it to deal with any standard or standards project that deserves national recognition, whether in the field of engineering, or consumer goods. The conference also commended the work of the National Bureau of Standards but expressed the opinion that it can increase the value of its services to industry by strengthening its work on the fundamental standards and methods of measurement, and on the development of data needed in standardization activities.

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GENERAL SCIENCE

Canadian NRC Active in Scientific Research Work

➤ THE CANADIAN National Research Council recently issued a review of its work during the past year, in which its important war functions in the field of science are covered. The Council operates 11 research laboratories, acts as adviser to the various government departments, and organizes and coordinates wartime scientific, engineering and technological research activities in universities, colleges and industrial laboratories throughout the nation.

This third function is performed generally through 50 "Associate Research Committees, a distinctly Canadian mechanism of proven effectiveness." These committees are set up and convoked by the National Research Council but operate as associations of the leading experts in their particular research fields. They receive financial grants, lay out programs and allocate problems to laboratories.

This Canadian Council, set up over 25 years ago, has greatly expanded during the war and now directs practically all its efforts to war work. Its principal activities are in problems concerned with aeronautics, explosives, ballistics, medicine, foods, and in secret matters in which experts of the departments of national defense, munitions and supplies are collectively engaged. In addition to research problems in its own laboratories, it is supporting 162 projects in the laboratories of 29 widely distributed institutions.

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CHEMISTRY

Still Converts Salt Water Into Safe Drinking Water

➤ A NEW pocket-size solar still assures a continuous supply of fresh water to Army and Navy flyers forced down in tropical waters. The still, under average conditions in the Southwest Pacific, can convert salt water into safe drinking water at a rate of more than a pint in eight hours. Under ideal conditions it can turn out almost double that amount in the same period of time.

The basic idea for the Sunstill, manufactured by the Gallowhur Chemical Company, was conceived by Richard Delano of Locust Valley, N. Y. It actually harnesses the rays of the sun to make drinking water of sea water. The still itself consists of a vinyl plastic envelope folded into a pocket-size package. It is inflated like a balloon and tied alongside the lifeboat or raft, so that it floats on the water. A black cellulose sponge, stretched through the middle of the envelope, soaks up water and absorbs the heat of the sun. Then, through evaporation and distillation, the sea water is converted into safe drinking water.

There are no moving parts, and the device will work indefinitely. Until the development of the Sunstill there were only four other methods of providing survivors with the first essential to their well-being, water: equipping the craft with canned or bottled water; catching rainwater in a tarpaulin; the use of desalination briquettes; and the squeezing of water from fish. The Sunstill has high priority on the list of equipment used for air-sea rescue in the Pacific.

Science News Letter, February 10, 1945

HORTICULTURE

Leaf-Color Chart Helps To Get Redder Apples

➤ THE REDDER the apples the better they sell. But the right shade of green in the apple-tree's leaves is an indicator of how red the apples will be, since healthy dark-green in leaves and lively red in apple skins both result, in part, from proper adjustment in the amount of nitrogen fertilizer fed to the tree.

Working on this principle, two Cornell University faculty members, O. C. Compton and Prof. Damon Boynton, made careful laboratory studies of the color of leaves collected in midsummer from trees under different nutritional conditions. Using their spectrophotometer data a New York City research corporation made up a set of seven carefully compounded printing inks, with which a chart of seven leaf-green shades has been prepared. Now all an apple-grower needs to do is hold the chart alongside sample leaves from his trees, and he will get an idea of how things stand with their nitrogen nutrition.

In general, high nitrogen produces apples of large size but poor color; and since color is the deciding sales factor a compromise must be sought between color and size.

The work of the two Cornell researchers has thus far been confined to one apple variety, the McIntosh. However, since about half the apples raised in New York are of this variety, their studies are considered of particular importance for this state.

Science News Letter, February 10, 1945

IN SCIEN

METEOROLOGY

Clearing February Snow From the Alaska Highway

See Front Cover

➤ THE DEPTH of snowfall on the Alaska Highway is much less than that on main highways through the Rocky Mountains or in New York state for that matter! This OWI photograph, taken in winter, shows the section near Little Atlin Lake being cleared.

Snow is not considered a major weather hazard along the Alaska Highway. The mountain wall that separates the interior from the coast acts as a great weather barrier. On the highway side of the mountains the weather is more bitterly cold, but the volume of snowfall is correspondingly lighter.

Science News Letter, February 10, 1945

AERONAUTICS

Cargo-Carrying Plane Resembles P-38 Lightning

➤ PLANES THAT LOOK like the two-tailed P-38 fighters may continue to be regular visitors at American airports after the war is over, but they will come loaded with peacetime cargoes of mail-bags and express packages instead of concentrated trouble for Nazis and Nips. U. S. patent 2,367,538 has been granted on a cargo-carrying adaptation of the familiar "Lightning," to George C. Sullivan of Lockheed Aircraft Corporation.

Main cargo space in the new plane is back of the pilot's compartment in the central fuselage. Trucks for loading and unloading run under the long horizontal stabilizer between the twin booms. The cargo-space door is the whole rear end of the fuselage, hinged upwardly; the floor is designed to be level with the truck bodies.

Additional stowage space is provided underneath the motors in the two nacelles; the inventor suggests these compartments as desirable for mail carriage. Still more space may be made available in the thickness of the wings; these compartments would be provided with sliding trays for quick transfer of their contents.

Science News Letter, February 10, 1945

E FIELDS

CHEMISTRY

Melamine to Be Available In Larger Quantities

➤ MELAMINE, a complex chemical compound containing nitrogen, carbon and hydrogen and used widely in making certain war essential and other plastics, will be available in larger quantities in the near future with the completion of a new building now underway at the Monsanto Chemical Company plant in Everett, Mass. This company owns the basic patent on melamine formaldehyde resins.

Melamine, a century old Swiss chemical, came into commercial use in making plastics less than a decade ago, but melamine plastics have developed rapidly because of recently discovered methods of producing the source material from dicyano-diamide which, in turn, is made from calcium cyanamide. This last named chemical is made from nitrogen and calcium carbide obtainable from coke and lime.

Employed in plastics, melamine produces a material characterized by limitless color range, good resistance to high and low temperatures, superior arc resistant properties, excellent moldability and exceptional utility as a surface coating. It is now being used in ignition and electrical control systems of military aircraft. Melamine resins are used in the preparation of plywood glues and laminates.

Science News Letter, February 10, 1945

CHEMISTRY

Addition of Selenium Improves Lubricating Oil

➤ LUBRICATING oils are found to be improved by the addition of small amounts of compounds of selenium, a non-metallic chemical element of the sulfur-tellurium group, as a result of investigations recently completed by the Battelle Memorial Institute. The selenium compounds impart many desirable features to the oil, including the ability to resist its tendency to oxidize and form sludge and gummy resins in the engine. A film of selenium-treated oil will support increased pressure between surfaces.

Selenium is usually found associated with sulfur in metallic sulfides. Discovered in 1817, it was long regarded as a waste product in the copper industry but later several important uses were found for it. Selenium colors glass a rose-red and so can neutralize the green tint of ferrous impurities. Red signal glass is made with it. Selenium insecticides are used, but they are toxic to some plants; and foods grown on soils containing selenium have toxic effects on animals.

Selenium is used also in radio and electronic equipment, the toning of photographic prints, the making of free-machining alloys, and the barnacle-proofing of ship hulls. Its beneficial use in lubricants will improve its position in the chemical world.

Science News Letter, February 10, 1945

METALLURGY

Manganese and Aluminum Bronze Distinguished

➤ QUICK, EASY, inexpensive and accurate is a new method, using an indicator solution recently developed, to distinguish between manganese bronze and aluminum bronze in scrap and other metal. In the past this has been largely guesswork, because of the similarity in appearance of the two alloys. The discovery was made by the U. S. Bureau of Mines at its experiment station in Pittsburgh.

To make the test, a small area of the metal is cleaned thoroughly of all dirt, scale and grease by grinding. This spot is then sprayed with a sulfuric acid solution. After the acid has had several seconds to react, a drop of the indicator solution is added. If the metal is manganese bronze a grayish-purple spot appears; but if it is aluminum bronze the spot is greenish-yellow.

The indicator solution consists of varied weights of ammonium-mercury thiocyanate, silver nitrate, and ammonium persulphate.

Science News Letter, February 10, 1945

CHEMISTRY

Quick-Killing Poison Made of Cyanide

➤ A QUICK-KILLING poison charge, to be fired into the snarling mouths of trapped coyotes or other predatory animals, is covered by patent 2,368,368, issued to Ethel P. Marlman of Las Animas, Colo. Potassium cyanide is mixed into a soft paste with petroleum jelly and loaded into shotgun shells. The charge is, of course, to be used at short range.

Science News Letter, February 10, 1945

ASTRONOMY

Kiev Observatory Is Now Completely Restored

➤ THE HUNDREDTH anniversary of Kiev Observatory can now be celebrated in the restored university buildings. The work of rebuilding the observatory—built in 1845, and thus one of the Ukraine's oldest scientific institutions—is completed.

When the astronomers returned to Kiev from Sverdlovsk, a town about 1,900 miles away where the valuable equipment had been sent for safe keeping, they found the observatory building empty, its contents having been plundered by the German occupants.

Elderly scientists aided the technical staff in repairing the buildings and erecting the instruments, so that now regular observations are being carried out and students are again being taught there.

Plans have been made to extend the observatory in the near future. Work has already begun for mounting a big modern refracting telescope. A deep basement will be built for seismic apparatus and a building will be constructed for an astrophysical laboratory.

Science News Letter, February 10, 1945

GENERAL SCIENCE

Dr. W. J. Eckert to Head IBM's Science Department

➤ THE DIRECTOR of the Nautical Almanac Office at the U. S. Naval Observatory, Dr. Wallace J. Eckert, has been appointed to head the department of pure science organized by the International Business Machines Corporation.

Dr. Eckert will assume his new post at the IBM World Headquarters Building in New York upon completion within a few weeks of the 1946 volumes of the *American Nautical Almanac* and the *American Air Almanac,* and of the *American Ephemeris for 1947.*

Before going to the Nautical Almanac Office, where he contributed to the development and examination of new methods of navigation, Dr. Eckert was professor of astronomy at Columbia University. Here he organized a pioneer scientific computing laboratory. His principal field is celestial mechanics and astronomy of position.

The position of director of the department of pure science was created to further the company's program to advance scientific calculation.

Science News Letter, February 10, 1945

PHYSICS

War's Infant Prodigy

Just 27 months ago, the war's first American-made battle rockets were launched; since then they have become of first-rate importance in every theater.

By HOLMAN HARVEY

➤ ONLY 27 months go, the war's first American-made battle rockets—tank-shattering bazookas—were launched against Rommel in North Africa. In that short time, the rocket has become a factor of tremendous importance in every theater of the war, and on land, at sea, and in the air. Never before in the history of warfare has any weapon forged to such universal acceptance in so short a time.

As a measure of the crucial importance which we attach to rocket warfare, the Navy has tripled its budget for rocket production for its own and the Army's use to $100,000,000 a month for this year; while the Army has stepped up its own smaller expenditure thirteen times over last year to a total of $13,000,000 a month. The combined U. S. rocket program, with a total of over $1,350,000,000 earmarked for 1945, thus begins to approximate Army-Navy expenditure for heavy gun ammunition.

I have just talked with Army and Navy officers specially detailed to rocket development and research. They can't tell you much about the size, or range, or destructive power of weapons yet to come; but they will tell you that experimental models not yet perfected have been put into production and rushed overseas, and that one model is scarcely in the works before an improved one is awaiting its turn on the assembly lines.

The largest German launcher so far reported in action is a six-tube affair mounted on a two-wheeled carriage and weighing, in all, about 1200 pounds. It fires a 5.9-inch rocket.

"Secret" Weapon

One rocket used in our launchers which until recently was a closely guarded "secret weapon"—the 4.5-inch—is a far cry from the original bazooka rocket of 2.36 inches diameter. It is about twice as long as its 18-inch forebear, and, instead of a mere 3 1/3 pounds, it weighs 38 pounds. It packs the punch of a 105 millimeter howitzer shell.

A single-tube 4.5-inch outfit, mounted on a camera-style folding tripod, has been used by our soldiers in jungle warfare. Launcher and tripod weigh only 12 pounds, which, with the weight of the rocket itself, adds up to a 50-pound load. One foot soldier can advance with this outfit, set it up, and let go. But he'd better keep well to the side when he fires, for the blinding blast of hot gases rushing from the rocket's rear vent kicks up a furious wake of dirt and rubble to a distance of 25 yards or more. The soldier actually fires from a safe distance by means of a connecting electric wire and pushbutton. The blast kicks over the tripod and often bends or destroys it, so that the launcher is considered "expendable" with one firing. Dozens or scores of these individual 4.5 launchers can be connected up and fired simultaneously.

The bazooka, with its shoulder launcher which can be fired and refired many times, and its lightweight rockets, a plentiful supply of which can be carried by one man, remains, in improved form, a standby. At 200 yards, because of its famous "hollow charge," an American invention which concentrates the blast of the explosion at a single point, it can burn its way through six inches of armor plate, filling the tank's interior with flying fragments of molten steel and flaming gases.

The Navy's island conquests in the Pacific have shown the terrific striking power of massed battle-rockets. Troops have to land on heavily fortified beaches and move inland through matted tropical growth which give the defenders the advantage of dense cover. The Navy realized that a short-range, powerful weapon was needed to fill in the critical time between the lifting of the naval gun barrage from offshore ships and the arrival of landing boats at the shore line. But landing craft were too light to support an adequate number of guns with their heavy mountings. The rocket, with its comparatively featherweight launchers and its paralyzing short-range wallop, was obviously the answer.

LCI and LCT landing boats, converted into rocket-bearers, now spearhead our landings. As they near the shore, multiple banks of launchers send a continuous cascade of thousands of high explosive rockets crashing onto the beaches, knocking out pill boxes, barbed-wire, machine-gun nests, fortifications. Once beached, the rocket ships direct a creeping barrage inland ahead of our advancing troops, cover them as they land their equipment, emplace their guns, and dig in. Says the Navy in an official statement describing a sample attack by rocket-boats: "Each craft carried hundreds of rockets. The projectiles are divided into racks and fired in salvos." The fire power is comparable to that of a battleship. The rocket ships are so successful that the Navy is arming bigger and bigger boats with the new weapon.

Aircraft Weapon

The rocket's light weight makes it of special value, too, as an aircraft weapon. Furthermore, the rocket has little or no recoil to deflect a plane from its true-course, as would the discharge of a sizeable cannon. The Navy now has in action a new five-inch aircraft rocket with explosive power equivalent to a 155 millimeter shell.

Army fighter planes now mount a battery of six rocket launchers beneath each wing. Rockets launched from a plane in rapid flight are much more accurate than those launched from stationary positions, for the plane's speed is added to their own, and speed tends progressively to hold any moving object to its course. Aircraft rockets are now more accurate against enemy targets than an equal weight of free-falling bombs, and at ranges up to 400 yards, as accurate as aircraft machine-gun fire. But rockets, so far at least, are not replacing those weapons; they are additional equipment. As against a maximum of 12 rocket shots, a plane's machine guns deliver hundreds of rounds and are instantly reloadable. The rocket racks cannot be reloaded in flight. The wind resistance created by rockets lined up beneath the wings slows the plane and affects its maneuverability and balance. For this reason the rockets can be jettisoned by the pilot at a moment's notice.

How important the rocket eventually will become depends largely on whether it can be made to achieve better accuracy. Precision manufacture of parts has

accomplished much in that direction. The bazooka appeared with stabilizing fins. Newer rockets have folding fins which spring open after the rocket leaves its launcher. For the first time, too, rockets have been given spin by an ingenious arrangement of the tail vents. This is a pioneering effort to get the same benefit which rifling the barrel gives a shell.

The Army has developed a propelling powder which burns more uniformly, gives increased speed (which improves accuracy), and is less subject to atmospheric conditions than previous rocket fuels.

A rocket is nothing more than a cylindrical casing of metal with a pointed nose and an open vent or vents at its rear end. The head is packed with a high explosive charge, as is any artillery shell. The rear section is packed with powder. When touched off the powder burns furiously. The gases thus produced escape through the vent. What drives the rocket forward is not any push of the gases on the outside air, but the pressure the expanding gas within the cylinder exerts against the forward end of the rocket. The distinction is important. It explains why a rocket travels faster at high altitudes—the thinner atmosphere offers less resistance to the progress of the projectile. If the rocket were propelled by the push of its exhaust, it would fly more slowly in thin air, having less to push against.

The rocket is just another way of delivering an explosive charge against a target. It has vast advantages within its own sphere of action, and it has its disadvantages which, for the present, disqualify it for many uses.

The German V-2 is a rocket that derives all of its motive power from the fuel it carries, and does not depend upon the intake of outside oxygen for combustion as does the V-1, which is classed as a machine. The British Ministry of Information states that the V-2 ascends to a height of 60 land miles, attains a speed of 3000 miles an hour (several times faster than sound), and has a maximum range of 200 miles.

But the rocket men never rest. Hundreds of square miles of our Mojave Desert thunder these days to the crashing of rockets as American research sends ever newer models to these vast testing grounds. The United States is convinced that it can beat the Germans in developing these weapons. And we intend to stay out in front.

Science News Letter, February 10, 1945

(This background story on rocket development will appear in The Reader's Digest for March.)

INVENTION

Improved Apparatus for Peeling Wheat Is Offered

➤ AN IMPROVED apparatus for peeling wheat is offered by Theodore Earle of Pacific Palisades, Calif., for patent 2,366,711. "Peeling" wheat consists in gently bruising it to remove the outermost corky layer, which has no nutritional value, leaving the beneficial parts of the bran to go through the milling process with the rest of the grain. This was done at first by immersing wheat in water in rubber-lined flotation cells, and spinning it violently against the walls.

In Mr. Earle's new process, complete wetting of the grain is avoided. Instead, it is merely moistened, then fed into a rotating rubber-lined cylinder. Rolling loosely on the bottom are several rubber-covered metal rods. Riding over the grain, these apply just enough pressure to loosen the corky epidermis, which is blown off.

Science News Letter, February 10, 1945

MEDICINE

Streptomycin Effective For T.B. in Guinea Pigs

➤ STREPTOMYCIN, one of the newest of the germ-against-germ medical weapons, can exert a "striking suppressive effect" on tuberculosis in guinea pigs, Dr. W. H. Feldman and Dr. H. C. Hinshaw of the Mayo Foundation and Clinic have reported.

What effect it might have in suppressing tuberculosis in humans is not stated in their report, recently published (*Proceedings, Staff Meetings, Mayo Clinic,* Dec. 27).

Streptomycin, which is obtained from a bacillus that lives in earth, was discovered by Dr. Selman A. Waksman, Dr. Albert Schatz and Dr. Elizabeth Bugie, of Rutgers University and the New Jersey Agricultural Experiment Station. They found it a powerful weapon against tuberculosis germs in test-tube experiments and suggested the guinea-pig trials to the Mayo group, which has been investigating the anti-tuberculosis action of other new substances.

Streptomycin, they found, does not have any toxic effect on guinea pigs. The animals can stand daily doses without any harm. Doses of human tuberculosis germs that caused widespread and destructive infection in the bodies of untreated guinea pigs caused hardly any detectable signs of disease in the animals that got daily doses of streptomycin.

Science News Letter, February 10, 1945

CHEMISTRY

Eggs Kept in Edible Condition for One Year

➤ EGGS—best replacement for point-scarce meats—may be kept in good edible condition for as much as a year by means of a new flash heat treatment developed by Prof. Alexis L. Romanoff of Cornell University.

The treatment is very simple, and requires only such equipment as may be found in an average kitchen. It consists merely of plunging the eggs in boiling water for five seconds, letting them cool, and putting them away in a refrigerator. Eggs thus treated may even be kept without refrigeration, but they will stay good for only about three months, as contrasted with 12 months in the refrigerator. Cold-storage eggs remain in edible condition for about six months, Prof. Romanoff states.

Science News Letter, February 10, 1945

Do You Know?

The first transatlantic *radio-telephone message* was transmitted in 1915.

Vitamin K is not stored in any significant amount in the body.

Crude petroleum oil was bottled and sold less than a century ago, represented to have "wonderful curative powers."

Arizona leads the United States in *copper* production and has done so for 34 years.

Spain has a new type of *railroad train;* it is streamlined, light, swift, comfortable, and economical to build and operate.

The *London zoo* was damaged by 12 German robot bombs but no serious harm done to the animals.

Some 6,000,000 *refrigerators* will be in demand immediately after the war; in 1941 the number built was approximately 3,700,000.

The 27,000,000 milk *cows* in the United States in 1943 produced nearly 55,000,000,000 quarts of milk or over 2,000 quarts each.

Only two of the 3,000 kinds of *lizards* that inhabit the world are poisonous, these two are the Gila monster and the Mexican beaded lizard.

With the shortage of *coal* in Sweden due to stoppage of importation from Germany, wood has become the most important available fuel.

Rochelle *salt crystals* possess the necessary properties to make them usable instead of quartz in radio work but their employment is limited because they melt at 120 degrees Fahrenheit.

Wolverine fur is highly prized in Alaska, not alone because of its scarcity, but because it will not ice up from the breath as other furs do, and therefore is used to line parka hoods next to the face.

Asparagus butts, now wasted, yield, when pressed, a juice than can be used as a culture medium to produce bacterial proteinase, an enzyme that splits proteins; it is used in the brewing, textile, leather and rubber industries.

BOTANY

NATURE RAMBLINGS

by Frank Thone

Spring's Precursors

WINTER'S death-tyranny is never complete; there is always an underground rebellion of life, breaking into overt expression at the least relaxation of the cold's iron grip. Let a few warm days intervene between cold waves, at any time during the winter, and you are likely to see flowers on the bare branches of such shrubs as forsythia and oriental honeysuckle, in which dormancy seems to be of the lightest, and very easily broken. Wild violets in January or February are no uncommon occurrence, either. If there is a more prolonged spell of mild weather, slightly more reluctant spring blossoms begin to appear: lilac and flowering crabapple, silver maple and elm.

These are plants that normally "go to sleep" in autumn and are not due to flower before spring. Their buds will not develop until they have felt the pinch of frost. In some of them, however, a very light pinch suffices to unlock the chemical mechanism that controls dormancy, and the first warm spell after the first cold spell may bring on their precocious opening. As a rule, these little previews of spring do the plants no harm: there is still a large reserve of buds remaining unaroused, that will take care of the main flowering period when the time comes.

Then there are the flowers that bloom, not in the spring, but in the gray, chill dawn-time of the year, that precedes spring. We naturally think of such things as willow and alder catkins, and above all of that purple-nosed little toughie of wildflower society, the skunk cabbage. Given sun on their heads, willow and alder do not mind snow about their feet; their trunks and branches contain reserve resources enough to take care of the job of flowering, without demanding anything of the still-chilled roots. And skunk cabbage often pushes up through inches of snow, or cracks thin ice in the swamp-water standing over it. It is time for them to bloom, and they will not be denied.

Perhaps the maddest of all these flowers that do not wait for the returning sun to climb high in the heavens is witch hazel. This odd shrub blossoms only in the winter; its yellowish flowers, with their four stringy, strapshaped petals, may be seen on its leafless brown twigs at any time from late November until early March. But by the time the first shy buds of trailing arbutus begin to unfold, and before the earliest bloodroot shames the fading snow-patches with its pearly petals, the flowers of witch hazel, true to their elfin name, have vanished.

Science News Letter, February 10, 1945

More than 2500 products use *tin* cans for packaging.

A new *artificial leg,* invented in Sweden, is made of light metal and has knee, ankle and toe joints; the knee joint has an automatic lock which releases and locks with each step and prevents buckling when standing.

• Books of the Week •

➤ YOUTHS AND adults without scientific background, will be interested in ELECTRONICS FOR BOYS AND GIRLS, by Jeanne Bendick. It explains in easily understood language what electrons are, and how they are put to work to accomplish wonderful results in manufacturing wartime and other equipment. (*McGraw*, $1.50.)

Science News Letter, February 10, 1945

➤ INDUCTION HEATING and dielectric heating, processes now widely used in industries, are excellently covered in HIGH-FREQUENCY INDUCTION HEATING by Frank W. Curtis. It is a book for foremen as well as engineers and students. It contains many illustrations of installations in actual commercial use contributed by some of the makers and users of high-frequency equipment. (*McGraw*, $2.75).

Science News Letter, February 10, 1945

➤ ENGINEERS and industrial chemists will be particularly interested in COMMERCIAL METHODS OF ANALYSIS by Foster Dee Snell and Frank M. Biffen, but universities training chemical engineers and chemists for industries will be equally interested. Especially, it shows the method of approach to analysis of the innumerable complex commercial products on the markets including the colloids. (*McGraw*, $6.00.)

Science News Letter, February 10, 1945

• Just Off the Press •

CIVIL AVIATION AND PEACE—J. Parker Van Zandt—*The Brookings Institution*, 157 p., $1.

EDWARD BELLAMY—Arthur E. Morgan—*Columbia Univ. Press*, 468 p., illus., $5.

ELECTRONICS FOR BOYS AND GIRLS—Jeanne Bendick—*McGraw*, 148 p., illus., $1.50.

FOOD REGULATION AND COMPLIANCE—Arthur D. Herrick—*Revere Pub. Co.*, 646 p., $10 (vol. 1).

HENLEY'S TWENTIETH CENTURY BOOK OF FORMULAS, PROCESSES AND TRADE SECRETS—*Henley*, 865 p., $4, rev. ed.

LABORATORY MANUAL FOR GENERAL BACTERIOLOGY—Univ. of Minnesota—*W. B. Saunders*, 54 p., paper, illus., $1.

PIONEERING THE HELICOPTER—Charles Lester Morris—*McGraw*, 161 p., illus., $2.75.

A STORY OUTLINE OF EVOLUTION—Charles W. Grimes—*Humphries*, 244 p., $2.

TECHNOLOGISTS' STAKE IN THE WAGNER ACT, the National Labor Relations Act in Operation as it Affects Engineers, Chemists and Architects—M. E. McIver and others, eds.—*Am. Assn. of Engineers*, 260 p., paper, $2.

VAPOR TRANSMISSION ANALYSIS OF STRUCTURAL INSULATING BOARD—Frank B. Rowley and C. E. Lund—*Univ. of Minn.*, 71 p., paper, illus., 40c (Engineering Experiment Station Bulletin No. 22).

WHAT FOREIGN TRADE MEANS TO YOU—Maxwell S. Stewart—*Public Affairs Comm.*, 31 p., paper, illus., 10c (Public Affairs Pamphlet No. 99).

WHEN HE COMES BACK AND IF HE COMES BACK NERVOUS, Two Talks to Families of Returning Servicemen—Thomas A. C. Rennie and Luther E. Woodward—*Nat. Comm. for Mental Hygiene, Inc.*, 32 p., paper, 15c.

Science News Letter, February 10, 1945

INVENTION

Spray Method Used for Silver Coating Mirrors

➤ A SIMPLE kind of inorganic chemistry is involved in a method for silvering mirrors, offered by two Canadian inventors, Charles Trevail and Kurt P. Gladney of London, Ont., for patent 2,367,903. Over the surface to be silvered a fine spray is released, in which silver nitrate solution is mixed with a reducing solution containing hydrazine sulfate and the sulfate of one of the alkali elements such as potassium or ammonium. Patent rights are assigned to Hobbs Glass, Ltd., of London, Ont.

Science News Letter, February 10, 1945

• New Machines and Gadgets •

❁ *DRINKING fountain, quickly attachable to the ordinary faucet, is a pocket-size tubing upturned on each end. One end is threaded to fit the faucet; the other, smaller in size, is drawn out to a nozzle.*

Science News Letter, February 10, 1945

❁ *HOOK-TYPE wrench for both nuts and pipes has a hinged auxiliary handle fitted in a slot extending lengthwise in the regular handle. The grip of the hand forces the face of the auxiliary handle through the slot and against the nut, holding it firmly against teeth on the jaw of the hook.*

Science News Letter, February 10, 1945

❁ *SAFETY shield for cigars and cigarettes, when placed over the burning tobacco, permits smoking during blackouts by hiding the glow. It also catches and holds sparks and ashes. The cigar or cigarette is slipped into the ventilated shield and lighted through a tiny trapdoor on one side.*

Science News Letter, February 10, 1945

❁ *FLUORESCENT lamps are coated by a new method with the phosphors that make them glow. The tube to be coated is slipped over a fine tungsten wire to which high-voltage electricity is applied. Dry phosphor powder is blown in. The particles become electrically charged, fly to the glass, discharge and stick.*

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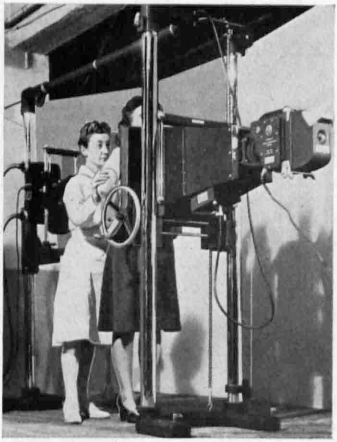

❁ *EQUIPPED with a phototimer that permits the taking of six uniform, accurate photographs a minute, the X-ray apparatus is shown in the picture. Used for chest surveys in checking tuberculosis, the timer measures the X-radiation coming through the chest and cuts it when the proper exposure has been made.*

Science News Letter, February 10, 1945

❁ *WOOD SURFACES are made fireproof, waterproof, denser and harder by a treatment just patented, which includes coating with a mixture of pulverized asbestos in a standard urea-formaldehyde glue and pressing moderately between heated metal plates. The finished surface is nearly as hard as glass.*

Science News Letter, February 10, 1945

❁ *YARN WINDING and holding device is mounted on one wrist, leaving both hands free for knitting. It consists of a metallic or plastic wristlet with a projecting arm on which is a revolving cylinder about which the yarn is wound. The yarn unwinds as used.*

Science News Letter, February 10, 1945

❁ *ROLL FILMS in a camera are advanced the proper distance with one stroke of the operator's hand by use of a simple device. A lever on the side of the camera forces rack teeth to mesh with a gear on the shaft and rotate the shaft the exact distance required.*

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If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, *1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 245.*

Question Box

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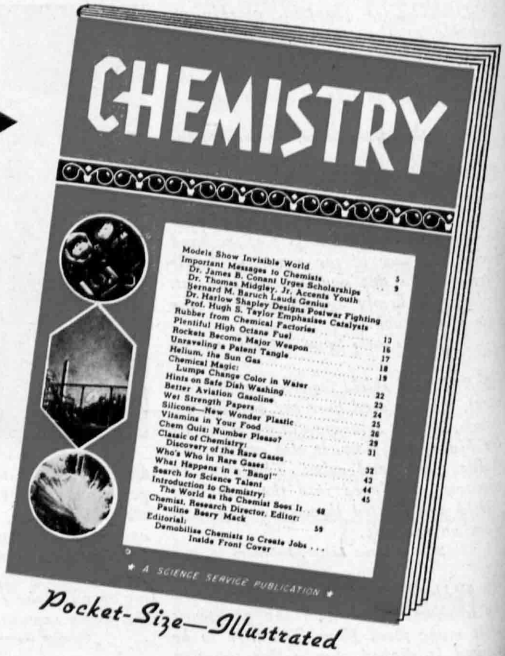

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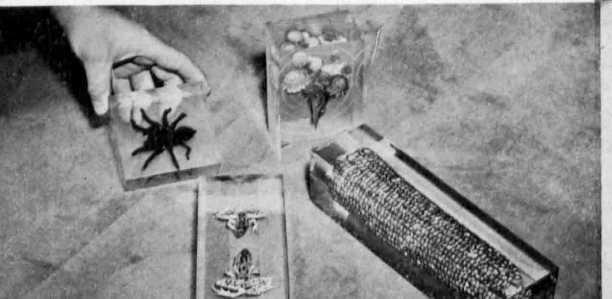

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