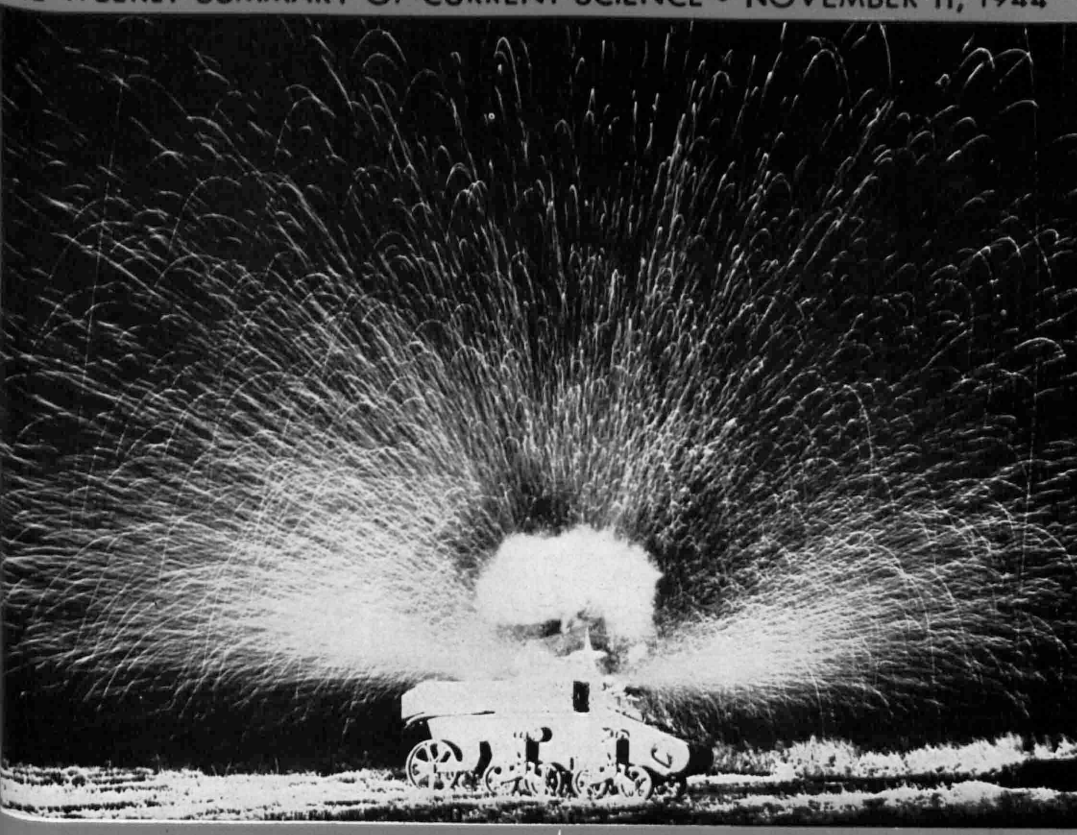
15¢

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • NOVEMBER 11, 1944



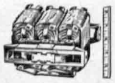
Molten Metal

See Page 314

A SCIENCE SERVICE PUBLICATION

KEEPING UP WITH *Electricity*

USING A LITTLE LIQUID AIR and some warm water, Westinghouse engineers now "manufacture" pocket-sized clouds and snowstorms that would fit into your hat, to help the Westinghouse Research Laboratories speed development of more powerful electrical systems for American warplanes. In a glass flask not much bigger than a milk bottle, artificial clouds and snowflakes are used to test the effectiveness of electrical insulation under conditions encountered by real airplanes at altitudes up to 12 miles.



MIGHTY MIDGET . . . To save precious pounds for extra fuel and ammunition, Westinghouse engineers have developed a 35 kilowatt transformer, for alternating current aircraft systems, which weighs *only 25 pounds*—less than 1/25th the weight of conventional transformers of similar rating. The secret of this weight-reduction is 400 cycle frequency, forced air cooling and the use of new, thin-gauge Hipersil steel in transformer core.

DONE WITH MIRRORS . . . To find out just what happens inside a steam turbine, Westinghouse research engineers worked out an ingenious system of mirrors—by which they actually photograph minute vibrations in turbine blades whirling at the terrific speed of 350 miles per hour. Result: important improvements in turbine blade design and greater insurance against turbine failure.

MEDICINE

Anti-Bleeding Vitamin

Nobelists describe their research on vitamin K; Dam declares future research must clear up the manner in which it acts to promote the formation of prothrombin.

By DR. EDWARD A. DOISY
St. Louis University School of Medicine
Nobelist in Medicine, 1943

➤ DURING the decade following Dr. Dam's discovery of vitamin K, the combined efforts of several groups of investigators have solved many of the important problems connected with vitamin K. Sources of the vitamin were discovered and in my laboratory methods of extraction and purification were devised. A satisfactory bioassay method was developed, and the isolation of vitamin K1 (from alfalfa) and K2 (from putrefied fish meal) was effected. The structures of K1 and K2 were elucidated and the structure of K1 verified by synthesis and of K2 by degradation studies. In addition, simple water-soluble compounds with antihemorrhagic properties were prepared for clinical use.

Many investigators had previously attempted to ascertain (*Turn to page 309*)

By DR. HENRIK DAM
Strong Memorial Hospital
Nobelist in Medicine, 1943

➤ GLADLY surprised at being recipient of a Nobel prize in medicine, my thoughts turn to work still to be done on vitamin K as well as to the days of its discovery.

Future research must clear up the manner in which vitamin K acts to promote the formation of prothrombin, one of the blood chemicals essential for normal clotting of blood when shed. It is only known that the process takes place in the liver.

It also remains to be found out what role vitamin K plays in the green plants and in bacteria.

Vitamin K, first found in Copenhagen in experiments with chicks, is necessary for blood clotting. Without vitamin K fatal bleeding occurs even from minor wounds.

Vitamin K is fat-soluble and occurs in various foods, especially in green vegetables. It also occurs in putrefaction bacteria.

Vitamin K prevents bleeding diseases which are due to lack of prothrombin, a protein-like substance occurring in the blood of normal persons. Vitamin K is not related to the hereditary bleeder's disease, hemophilia. Vitamin K deficiency occurs in cases of so-called obstructive jaundice caused by gall stones or tumors which obstruct the flow of bile into the intestine, bile being necessary for the absorption of vitamin K from foodstuffs through the intestinal wall into the blood stream.

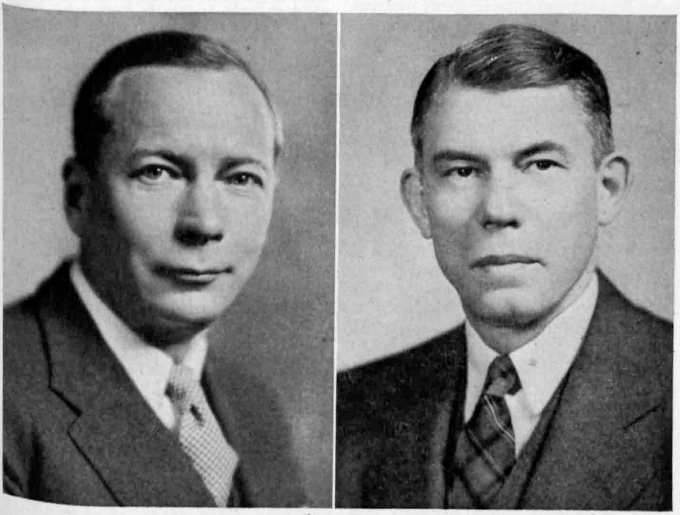
Death from continuous bleeding was formerly a very serious problem in surgical operations on such patients, but this risk is now avoided by suitable administration of vitamin K.

Newborn babies are usually more or less vitamin K deficient because the vitamin does not readily pass over from mother to fetus. Danger of bleeding exists in many newborn in the first few days after birth. This danger is prevented and the death rate among the newborn reduced by administration of vitamin K to the baby immediately after birth.

Certain forms of sulfa drug treatment will kill the bacteria in the patient's intestine thereby excluding an important source of vitamin K. Vitamin K therapy is advisable in such cases.

Uncontrolled excessive use of mineral oil may interfere with the proper absorption of vitamin K as well as of other vitamins.

Science News Letter, November 11, 1944



NOBELISTS—Dr. Henrik Dam (left), and Dr. Edward Doisy received the 1943 Nobel prize in medicine for the discovery and synthesizing of vitamin K.

(See also SNL, Nov. 4)

INVENTION

Platinum-Nickel Alloy Used in Glass Works

➤ A NEW platinum-nickel alloy, designed especially for use in manipulating liquid glass, is the subject of patent 2,361,578, issued to M. B. Vilensky of Newark, Ohio, assignor to the Owens-Illinois Glass Company. In working liquid glass, especially in the manufacture of glass filaments and fibers, a platinum-rhodium alloy has been much used. This has the disadvantage of high cost, primarily because of the scarcity of rhodium; the latter metal also tends to evaporate out of the alloy on prolonged exposure to high temperatures. Mr. Vilensky has found that an alloy of 95% to 99.5% platinum with 5% to 0.5% nickel gives very satisfactory service at a lower overall cost.

Science News Letter, November 11, 1944

PHYSICS

Color Transmitted by Wire

Photographs in full color can be sent and received at any distance by wire or wireless in the form of three-color separation films.

➤ PARIS fashions may one day be transmitted in full-color pictures to all parts of the world and full-color pictures of news events may be sent as rapidly as black-and-white pictures, as a result of a new process for the transmission of color by facsimile covered in patents recently granted to Finch Telecommunications, Inc.

Colored photographs can be sent and received at any distance by wire or wireless in the form of three-color separation films ready for the customary photographic processing in assembling a colored print.

The technique of sending and receiving color pictures is basically the same as for sending newspapers, weather maps, news pictures, police reports and other black-and-white pictures and text by facsimile.

The color picture is placed on a cylindrical drum in a machine where it is scanned, line by line, by a photo-electric eye. A color disk is placed between the scanning eye and the picture on the drum of the transmitter. This color disk contains triangular gelatin sections of three primary colors—red, yellow and green—so that each in turn is filtered out and recorded by exposure of the film on the receiver drum. The transmitting cylinder revolves at 300 revolutions a minute, while the color disk revolves only once a minute. In this way, the first color selected for transmission is filtered and sent out.

At the receiving end, the receiving drum has three times the circumference of the transmitting drum, so that it takes all three films which record the three principal colors. This drum revolves at 100 revolutions a minute.

Thus, when the transmitter has scanned a complete line, just as you are scanning each line of this story as you read it, the receiving drum has revolved only one-third of a revolution covering a single line on one color film. In this way, the scanner selects and transmits impulses for the three different colors, and the receiver exposes the films in the proper order for each color. When the transmission is complete, the three films are developed and printed by the same method used for making full-color prints of photographs.

Using wire instead of radio to transmit color pictures will enable engravers to separate either prints or color negatives into three separation negatives from which to make plates for letterpress printing in color. This rapid and low cost method would use both transmitter and receiver set up in the same room.

Science News Letter, November 11, 1944

NUTRITION

Superfortress Crews Get New Food Tray Galley

➤ PALATABLE and nourishing food is a must for crews of the giant Superfortresses that may be in the air 12 hours or more; without it efficiency will suffer. In the earlier days of the war, chow call aloft consisted of eating cold, unattractive sandwiches wrapped in paper napkins and carried in the pockets of flying suits. Reports from the aircrews overseas indicated that they wanted a hot meal to satisfy that empty feeling that comes after five or six hours in the air.

The problem was turned over to the Army Air Forces Tactical Center in Orlando, Fla., and after exhaustive tests, a new food tray galley was developed to serve the crews of Superfortresses, as well as other types of aircraft.

The food warmer which keeps precooked meals piping hot at the low temperatures experienced at high altitudes was developed after it had been proven that raw food cannot be conveniently cooked at high altitudes. In tests at 10,000 feet it took two hours to boil potatoes.

The new food warmer, designed for six men, is two feet tall and sturdy as a jeep. Inside its insulated cabinet is a thermostatic heat system which can be plugged into the plane's electrical power circuit. It contains six metal trays for holding a pre-cooked meal consisting of meat, vegetables and soup, each in separate compartments; 12 metal cups for fruit juices and coffee; a drawer for bread or rolls, fruit, silverware, and straws.

Food can be packed in the warmer hot or cold, and it can be warmed, or kept warm by the heating unit. If a member of the crew doesn't feel like eating his meal all at once, he can just stick what is left back into the warmer, and it will keep perfectly. Cooks are being specially trained in the preparation of food for packing in these food warmers. Complete menus built around energy-giving carbohydrates have been drawn up and standardized, so that crews can get quick restoration of energy during flight.

Science News Letter, November 11, 1944

SCIENCE NEWS LETTER
Vol. 46 NOVEMBER 11, 1944 *No. 20*

The weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington 6, D. C. NOrth 2255. Edited by WATSON DAVIS.

Subscriptions—$5.00 a year; two years, $8.00; 15 cents a copy. Back numbers more than six months old, if still available, 25 cents. Monthly Overseas Edition: By first class mail to members of the U. S. armed forces, $1.25 a year. To others outside continental U. S. and Canada by first class mail where letter postage is 3 cents, $1.25; where letter postage is 5 cents, $1.50; by airmail, $1.00 plus 12 times the half-ounce airmail rate from U. S. to destination.

Entered as second class matter at the postoffice at Washington, D. C., under the Act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and in the Engineering Index.

The New York Museum of Science and Industry has elected SCIENCE NEWS LETTER as its official publication to be received by its members.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., PEnnsylvania 6-5566; and 360 N. Michigan Ave., Chicago STAte 4439.

MEDICINE

Nerve Activity Research

Prizewinner declares work he did with Dr. Erlanger is the direct outgrowth of the advancements of modern physics; points out that there are alluring prospects ahead.

By DR. HERBERT S. GASSER
Rockefeller Institute for Medical Research
Nobelist in Medicine, 1944

➤ THE WORK for which the 1944 Nobel prize in medicine was awarded to Dr. Joseph Erlanger, of Washington University, St. Louis, and myself is the direct outgrowth of the advancements of modern physics.

One of the signs of activity in the nervous system is a change in the electrical potential accompanying the events and this sign is the only one that tells when the events take place. These changes are so small that formerly they were difficult to detect and at the same time the inertia of the recording instruments distorted their time course.

After the advent of the vacuum tube amplifier and the cathode ray oscillograph it was possible to develop a technique that surmounted both difficulties and then many older observations could be clarified and new ones brought to light.

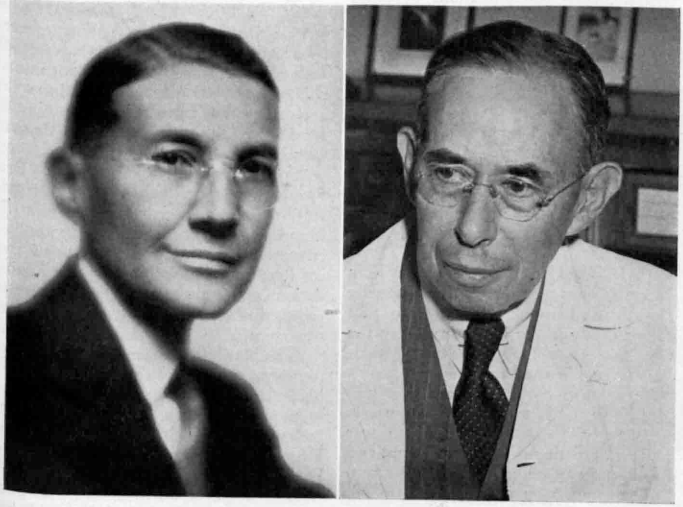
The first developments were in relation to the peripheral nerve. It was possible to reveal differences in the individual fibers that make up a nerve, differences in the velocity with which impulses are carried related to the size of the axons and differences related to the kind of fiber, for it has turned out that fibers can be divided on criteria other than velocity into three classes.

To a limited extent the several groups of fibers could be related to the physiological significance of the messages they carry. The events in the course of a single impulse in a fiber were determined with accuracy as to time and correlated with states of the nerve.

Certain events correlate with the momentary excitability of the fiber and this correlation forms a useful link in the chain leading up to an analytical study of the central nervous system. Some of the simplest neuron chains in the latter have been examined. But the subject is still in its infancy.

There are alluring prospects ahead with respect to the unravelling of how the central nervous system works. Needless to say, the foregoing summary contains allusions to contributions for which neurophysiology is indebted to the work of others than ourselves.

Science News Letter, November 11, 1944



PRIZE-WINNERS—Dr. Joseph Erlanger (right), shares the 1944 Nobel award in medicine with Dr. Herbert Gasser for their work on nerve activity.

From Page 307

the cause of the impaired coagulation of blood in obstructive jaundice but it was not until 1935 that Dr. A. J. Quick and his associates devised a satisfactory method for the determination of prothrombin and showed that in obstructive jaundice the prothrombin concentration may be markedly reduced. The delayed coagulation in obstructive jaundice as well as in vitamin K deficient chicks can be corrected by the administration of vitamin K and bile or of the simple water-soluble compounds with antihemorrhagic properties.

In certain diarrheal diseases, such as ulcerative colitis, sprue and celiac disease which may cause hypoprothrombinemia, the intravenous therapy of vitamin K is effective. Another important therapeutic use of vitamin K is to correct the hemorrhagic disease of the newborn. The treatment is extensively and effectively used in the mother prenatally or in the infant after birth.

Science News Letter, November 11, 1944

PUBLIC HEALTH

Mass Sanitation Work Fights Disease in Soviet

➤ A MASS war against disease is being fought successfully on the Soviet home front while the armies fight in the field.

More than 300,000 volunteer instructors in health and sanitation are aiding regular full-time staffs. Upon collective farms and in city neighborhoods there are 170,000 Red Cross posts in operation. In Moscow alone there are 10,500 sanitation instructors, including a thousand at public dining halls. Students are taking an active part in the work.

More than 33,000,000 pieces of popular literature have been issued, including some 10,000,000 in different languages of the U.S.S.R., and 5,000,000 lectures and talks have been arranged in the past two years.

The Soviet Scientists Anti-Fascist Committee, in making this survey, credits this educational work with helping to preserve the nation's good health record and preventing epidemics which are the usual accompaniment of war.

Science News Letter, November 11, 1944

PUBLIC HEALTH

More DDT Findings

New insecticide is apparently safe to use when dusted dry on the skin and when breathed in air into which it has been sprayed, results of two series of experiments show.

➤ DDT, SCIENCE'S newest and deadliest blitz-weapon against insects, though known to be poisonous to man and warm-blooded animals also, is apparently safe to use when dusted dry on the skin and when breathed in air into which it has been sprayed as an insecticide. Results of two series of experiments supporting this conclusion were presented before an audience of entomologists in Washington by Dr. Herbert O. Calvery of the U. S. Food and Drug Administration and Dr. Paul A. Neal of the National Institute of Health.

Dr. Calvery's nutshell summation was: "In solid form DDT applied topically to the skin is nonirritating, nonsensitizing and not appreciably absorbed. In solution, either in oil or in organic solvent, it does readily penetrate the skin, is very mildly irritating and a very mild sensitizing agent."

Dr. Neal corroborated his colleague's verdict so far as safety in use as a dry delousing powder is concerned, and added that spray or aerosol solutions containing 1% of DDT were breathed for long periods by rabbits without any tangible ill effects.

Furthermore, he said, "In a clinical and laboratory study of three men who had had several months' continuous occupational exposure to DDT in its various forms as an insecticide, an evaluation of the results failed to indicate any definite toxic effects."

Both Dr. Calvery and Dr. Neal reported that in their independently conducted investigations they found considerable differences among laboratory animals in susceptibility to DDT poisoning. Mice were more susceptible than rats, guinea pigs and rabbits, with monkeys and dogs most resistant.

When relatively large doses (well above ordinary insecticide levels) were absorbed through the skin or swallowed, symptoms of poisoning began to be evident. They were principally tremors, a "jumpiness" resembling that of strychnine poisoning, and convulsions ending in death. Autopsies disclosed fatty degeneration of liver and kidneys, or changes in nerve structure.

Dr. Neal concluded that although DDT need not be regarded as dangerous in ordinary insecticidal dusts or sprays, heavy contaminations of foods should be avoided.

Science News Letter, November 11, 1944

ENTOMOLOGY

Bomber Sprays DDT

For the first time in medical history an entire island has been sprayed, suggesting the idea that in the future this method may be used to kill mosquitoes before troops land.

➤ TROOPS making D-Day landings in the future may find the beachheads free of disease-bearing mosquitoes and other insect pests, thanks to a pre-landing DDT spraying of the area from the air. This suggestion comes from medical men enthusiastic over the results of using the potent insecticide for systematically ridding an entire island in the Pacific of disease-carrying insects, Capt. Earl J. Wilson and Capt. James A. Kelly, Marine Corps Public Relations Officers in the Pacific, report.

It is the first time in medical history that an entire island has been sprayed with DDT. The job was done with a Marine Corps torpedo bomber especially rigged to distribute the solution that sprays death on the insects which in the past have claimed more casualties than bullets have in the Pacific war.

Twenty-two hours after the first planes landed on the battered airfield, a nearly invisible mist of a DDT solution was settling over the rubble-strewn island and its mosquito-breeding mangrove swamps.

The spray, a mixture of DDT in oil, is said to kill every insect on contact.

DDT also has been used on this island in great quantities on the more than 7,000 Japanese corpses counted and buried thus far. And it also is being used in hand sprays around mess halls and latrines, and other areas where dysentery-carrying flies abound.

The DDT is sprayed from pin-hole nozzles in a short length of gas pipe attached beneath each wing of the plane. The makeshift gadget was devised a short time prior to this operation by Navy Comdr. Winslow T. Tompkins (MC), of Iowa City, Iowa, and Marine Lt. Col. Walter T. Brownell, of Tuscaloosa, Ala., formerly chief aeronautical engineer, Howard Aircraft Company.

Comdr. Tompkins described the problem to Lt. Col. Brownell, his roommate at a rear base, who made a rough pencil sketch. The Seabees did the rest with a piece of gas pipe.

The torpedo bomber was found to be the best plane for spraying the fluid. Flying at 125 miles an hour at an altitude of 150 feet, it sprays 10 gallons of the DDT solution per minute. This island is approximately 6,400 acres in extent and it is estimated two quarts of the solution are sufficient to cover an acre.

The Japanese do not have DDT and rely upon a repellent stick with a citronella base, or else on a punk made of ground red cedar bark, to protect them.

Science News Letter, November 11, 1944

MEDICINE

Cancer Fight Should Be Organized, Doctor Urges

➤ PUSHING the fight against cancer by organizing all activities on a national scale was urged by Dr. R. R. Spencer, chief of the National Cancer Institute, in accepting the Clement Cleveland Award for 1944 of the New York City Cancer Committee.

"Special cooperative committees," Dr. Spencer suggested, should be selected from members of various cancer research foundations, the American Cancer Society, the American Association for Cancer Research, the National Cancer Foundation and other institutions actively engaged in cancer control, prevention or treatment.

"The National Cancer Institute desires to accept its share of this responsibility," he declared.

Acquiring more knowledge about cancer is essential, he said, but this knowledge must be shared with the public and physicians.

"The taxpayer has the right, not just the privilege, to be kept informed," he declared.

Science News Letter, November 11, 1944

MEDICINE

New Use for Fibrin Film

May play a part in preventing the convulsions which are the most serious aftermath of gunshot wounds of the head; is used as a sheet to replace membranes of the brain.

➤ SHEETS of fibrin film, "marvelous new substance" developed from blood plasma, may play a part in preventing the convulsions which are the most serious aftermath of gunshot wounds of the head, Dr. Ernest Sachs, of St. Louis, reported at the meeting on nervous and mental diseases and war sponsored by the Chicago Institute of Medicine.

Epilepsy or convulsions attacked 34 out of every 100 who survived head wounds in the last war, British scientists have found. Convulsions may develop as late as 20 years after injury, though in most cases they appear within the first weeks or months and it is unusual for a patient to develop convulsions after five years.

Convulsions are more likely to develop in war wounds than in head injuries in civil life, probably because in the war wounds there is usually not only a skull fracture but injury to the brain or the membranes covering it or both.

The convulsions are due to this injury to membranes and brain and the associated scar, Dr. Sachs stated. This is where the fibrin film discovered by Prof. Edwin Cohn of Harvard Medical School, comes into the picture. The important thing in treatment, Dr. Sachs said, is to prevent as far as possible the formation of the scar. This is done by cutting out all injured brain tissue with an electric knife and replacing the covering membranes of the brain with sheets of fibrin film.

Brain wave records also may play a part in helping men with head wounds to full recovery. Once epilepsy has developed, Dr. Sachs explained, it continues in spite of the surgeon's later efforts to remove the scar from the brain and membranes. If the brain wave records would show, weeks or months or years before the convulsions begin, that a patient who had a head wound is going to have convulsions, it might point to the need for an early operation and thus a possible cure.

Epilepsy, it has been found, is associated with a disorder of brain waves and in some patients with grand mal epilepsy, the convulsions or seizures can be predicted many hours in advance by the increasing frequency of abnormal waves.

Science News Letter, November 11, 1944

Desire Child-Like Care

➤ THE LARGEST number of our mentally sickest returned soldiers are made up of passive-dependent individuals who long to get home to wife or mother and be taken care of as though they were babies, Lt. Col. Roy R. Grinker, of the Army Air Forces, stated at a meeting on nervous and mental diseases and war held in Chicago under the auspices of the Chicago Institute of Medicine.

No matter how carefully selected through psychiatric tests, almost every man will break down if the stress of air combat continues long enough, Col. Grinker pointed out. By bringing adequate treatment for these breakdowns close to operational bases, however, it has been possible to return 95% of officer patients and 80% of enlisted men to full duty.

Those who fail to respond to treatment are of five types: the passive-dependent types who want to return to a childish status, those with hostile-aggressive reactions, the depressed, those with physical symptoms, and the infrequent psychotics.

The hostile-aggressives are likely to be sullen and unruly and when under the influence of alcohol may attack civilians or fellow-soldiers who have not been overseas.

When the emotional breakdown shows in physical symptoms, these usually are referred to the stomach and intestinal tract. The men complain of pain and nausea and vomit all but milk, showing that they, too, are reverting, or regressing as psychiatrists term it, to a babyish level.

Depressions usually involve personal loss, such as that of an officer or a comrade, for which the patient blames himself, Col. Grinker said, while the infrequent psychotic-like type loses the ability to recognize his present safety and sees himself back in combat every time he closes his eyes.

Science News Letter, November 11, 1944

Leader Saves Minds

➤ MEN WHO are borderline cases of psychoneurosis and whose fitness for combat duty is (*Turn to page 316*)

RUBBER FROM DANDELIONS—E. B. Newton and Dr. H. L. Trumbull of the B. F. Goodrich staff examine some bales of the U. S.-grown product. The seeds of the Russian kok-saghyz (dandelion) plant were flown to the United States in the darkest days of the rubber shortage. The rubber is comparable to prewar Far East plantation grades.

PSYCHOLOGY

Psychologists in Army May Obtain Commissions

➤ PSYCHOLOGISTS serving in the Army as enlisted men are now offered an opportunity to obtain commissions as second lieutenants, upon applications made through their immediate commanding officers. Those considered qualified include those whose professional training and experience ranged from psychological testing and counselling to teaching in colleges and caring for mentally and physically handicapped cases.

Minimum education requirements are a bachelor's degree in psychology, sociology, or educational or industrial psychology.

Science News Letter, November 11, 1944

MEDICINE

Spinal Anesthesia Used For Quadruplets' Birth

➤ THE CONTINUOUS spinal anesthesia given to Mrs. Kathleen Cirminello for the birth of her quadruplets in Philadelphia was chosen because of its unique safety feature, Dr. Robert A. Hingson, U. S. Public Health Service surgeon who developed continuous caudal anesthesia for childbirth, and is conducting courses for physicians, declared.

The safety feature of continuous spinal anesthesia is that it can be given in reverse, that is, some of the anesthetic drug can be withdrawn from the spinal canal if the mother shows any sign of toxic reaction. This cannot be done with any other type of anesthesia. With five lives to consider at once, instead of the usual two, and in view of a complication the mother had in a previous pregnancy, the doctors decided to take advantage of the special safety feature of continuous spinal anesthesia.

Originally Mrs. Cirminello was given a solution containing 40 milligrams of procaine, the anesthetic drug used. Then 15 milligrams were taken back. So she actually got only 25 milligrams, which is about one-fourth the anesthetic dose that would be used ordinarily for any surgical procedure. Yet although she was conscious and awake, as she would have been had the anesthetic been injected into the caudal space instead of the spinal canal, she suffered no pain during the Caesarean operation by which the quadruplets were delivered.

Each of the four babies cried within one second after being born, Dr. Hingson said. This indicates the good condition in which they entered the world. They were all delivered within four minutes, but whether this is a record time cannot be told, since this is the first Caesarean delivery of quadruplets.

Continuous spinal anesthesia has been used at Philadelphia Lying-In Hospital for 200 Caesarean births, and continuous caudal anesthesia for about 260 Caesareans.

Science News Letter, November 11, 1944

METEOROLOGY

Round-Up on Hurricane Is Now Complete

➤ THE U. S. Weather Bureau has now completed a round-up on the hurricane of Sept. 8-16, which shows that for violence and destructiveness it competes with the more notorious storm of Sept. 17-21, 1938, though it does not quite equal it. The recent tempest took a toll of 390 lives, 344 of which were lost at sea; the 1938 hurricane piled up a death-list of 494. Property damage caused by the 1944 storm is estimated at $100,000,000, as against losses of $250,000,000 to $330,000,000 in 1938.

Lowest barometric readings taken along the coast during the storms were very close together for both storms: 946.2 millibars (27.94 inches) in 1938, as compared with 947.2 millibars (27.97 inches) in 1944. Highest wind velocities for a five-minute period also were close, both in magnitude and in location of observing point. Top wind speed in the 1938 storm, as measured at Providence, R. I., was 87 miles an hour; in the recent hurricane an observer on Block Island, R. I., reported a maximum five-minute velocity as 82 miles an hour.

Highest single reading in 1938 was 183 miles an hour, at the Blue Hill Observatory in Massachusetts; in 1944 the comparable record was an estimated 150 miles an hour at Cape Henry, Va. These figures are not strictly comparable, however, for the 1938 record was made at the top of a long hill, whereas the 1944 figure was attained over flat country.

A weather officer in an Army reconnaissance plane (unnamed by the Weather Bureau) reported a terrifying experience. Caught by a wind of an estimated 140-mile-an-hour velocity, the plane defied the combined efforts of both pilot and co-pilot to control it, and all hands thought it must certainly crash in the sea. When it finally struggled back to base, it was found that 150 rivets had been sheared off on one wing alone.

Science News Letter, November 11, 1944

IN SCIEN

AERONAUTICS

New Naval Fighter For Photo Reconnaissance

➤ A NEW British naval fighter, called the "Firefly," designed to be operated from an aircraft carrier, has been announced by the British Air Commission.

A low-wing, single-engine plane, it carries four 20-millimeter cannon, two in each wing, and a camera for use in photo-reconnaissance work. The engine that thrusts it through the air is a Rolls-Royce Griffon, which develops more than 2,000 horsepower, is liquid-cooled and supercharged. This compact engine develops more than one horsepower for every pound of its weight. The plane carries a crew of two, a pilot and either an observer or a navigator.

The wings, which measure 44 feet 6 inches, can be folded for economical space stowage in the aircraft carrier.

One interesting feature of the new plane, developed by Fairey Aviation Company, Ltd., is the hydraulically controlled wing flap. The flap may be extracted from its position in the trailing edge of the wing and swung out to give varying positions for take-off, cruising or landing. When not in operation, the flap is flush with the wing structure.

Science News Letter, November 11, 1944

CHEMISTRY

Alcohol Economically Made From Sweet Potatoes

➤ SWEET potatoes offer the South an excellent possibility for agricultural and industrial expansion by virtue of their value as a raw material from which alcohol may now be economically made, stated J. A. Jump, A. I. Zarow, and W. H. Stark of Joseph E. Seagram and Sons, Inc., Louisville, Ky., reporting on recent investigations conducted by them, and a commercial trial following their laboratory experiments. They used dehydrated sweet potatoes in their work.

The yield of alcohol from sweet potatoes in terms of acres of land, they find, is much higher than can be obtained from grain and closely comparable with the amount obtained from sugar cane. Dehydrated sweet potatoes offer the advantages of storage to provide an all-year-round supply.

Science News Letter, November 11, 1944

E FIELDS

CHEMISTRY

Use of Cadmium Improves Camouflage Paint

➤ CADMIUM is utilized in a new camouflage paint, on which patent 2,361,473 has been issued to W. C. Granville of New York City, assignor to the Interchemical Corporation. Use of a cadmium compound for this purpose is important, the inventor states, because of the increasing use of infra-red plates in aerial photography. These easily distinguish between the green of natural foliage and ordinary green paints because the latter reflect little infra-red radiation. Cadmium compounds come much nearer to grass and green leaves in infra-red reflecting powers.

Science News Letter, November 11, 1944

INVENTION

Inventors Council Lists 34 Needed Ideas

➤ A SMALL, light-weight dependable gasoline engine, rating from one to five horsepower and capable of operating on 100-octane aviation fuel, is wanted by the Army Air Forces, and ideas from the public that may contribute to the development of such an engine are requested by the National Inventors Council. Other Army needs are a high-precision, low-friction bearing that does not involve the use of balls or rollers, and a liquid or paste which will prevent the formation of ice on airplane surfaces.

These three items are among 34 needed inventions listed by the National Inventors Council, with the approval of the Army Air Forces. Several needs have to do with parachutes and parachute operation. One is for the quick release of a cargo parachute from the cargo when the cargo hits the ground. Another is for a parachute opening device that will provide automatic opening at a definite altitude above the ground. Low cost aerial delivery parachutes, better harness with improved quick-releasing hardware, new canopy designs, and parachute drop test instruments are also listed and inventive ideas relative to them requested.

Material with the electrical properties and heat resistant characteristics of mica is desired in aviation. Other items listed include a simply installed thrustmeter, a shock absorber that does not require the use of synthetic packing to retain the fluid in the strut, and an automatic ground speed measuring device.

The National Inventors Council, organized in the U. S. Department of Commerce, was created in 1940 to receive and handle inventive ideas submitted by citizens to help win the war. It has a staff of engineers and other experts, and a system of technical committees, so that useful ideas may be quickly evaluated and put in the hands of the proper military and naval divisions. Inventive ideas are wanted by it in all fields.

Science News Letter, November 11, 1944

AERONAUTICS

Super Flying Jeep Designed for Jungles

➤ FACTS about a new giant of the sky that might be called a "super flying jeep" because it can take off from and land on very short runways or even rough fields, have recently been released by the War Department.

Although the new cargo plane, designated the C-82, cannot be maneuvered in and out of tight spots like the tiny "flying jeep," used successfully for low-level artillery fire control, messenger work, and medical rescue work as well as other jobs in both theaters of war, it can be used to carry heavy loads of troops and supplies to points where other cargo planes cannot land. For this reason it is expected to be especially valuable for Pacific warfare.

The C-82 is the product of the combined engineering talents of the Air Technical Service Command at Wright Field, Dayton, Ohio, and the Fairchild Aircraft Corporation, Hagerstown, Md. It is the first freight-carrying plane ever to make use of the twin-boom tail, the distinguishing feature of the P-38 Lightning fighter plane, and the recently-released P-61 Black Widow night fighter.

Science News Letter, November 11, 1944

PLANT PHYSIOLOGY

Cool Nights Aid Growth Of Native Rubber Shrub

➤ GREENHOUSE-grown guayule, native American rubber shrub, thrives on low night temperatures, reports Dr. James Bonner of the California Institute of Technology.

Night temperatures ranging from 40 to 45 degrees Fahrenheit bring about a maximum rubber yield in greenhouse-grown plants.

Science News Letter, November 11, 1944

CHEMISTRY

Smoother Soaps Expected Through New Process

➤ SMOOTHER soaps, more suavely scented, are expected to be obtainable from foul-smelling greases and rancid oils hitherto considered hopeless as sources, through a new process for distilling fatty acids on which U. S. patent 2,361,411 has been issued to John F. Murphy of Fitchburg, Mass.

All ordinary oils and fats (including the kitchen wastes which housewives are now urged to save) split chemically into two main components: glycerin and one or more fatty acids. The latter, combined with a mild alkali, become soap.

Many salvaged greases and oils contain extraneous substances that impart disagreeable odors and bad colors ruining their chances of being utilized in high-grade soaps. To get rid of them, Mr. Murphy's process first distils the crude soap stock under a moderate vacuum. This takes off the more volatile of the malodorous substances. Then the vacuum is increased, and the desired fatty acids themselves distill off, leaving behind the heavier, ranker compounds of lower boiling point.

Rights in the patent are assigned to a well-known soap-making firm, Lever Brothers Company.

Science News Letter, November 11, 1944

INVENTION

Combined Lighting and Air Conditioning Systems

➤ A COMBINED lighting and air-conditioning system, in which the air is heated, cooled, ozonized, or sterilized, has been granted patent 2,359,021, the patentees being Horatio Guy Campbell and George Donald Skinner of London, England. It is applicable to installations in which the lighting means consists of discharge lamps, which employ an inductance or resistance to control the flow of current. The air is circulated by convection or by an electric fan.

The conditioning unit is placed over the tubular gas discharge lamps, between them and the ceiling. If the air is being ozonized, the ozone transformer in this unit may serve as a controlling inductance for the lamp. If the air is heated by an electric heater, the resistance winding may be used to control the lamp. For sterilizing the air, the unit uses the electric discharge lamps themselves by employing lamps of a germicidal type, producing ultraviolet rays.

Science News Letter, November 11, 1944

PHYSICS

Rockets for War or Peace

Some day fishermen may have rocket harpoons, you may travel in streamlined railroad cars propelled by rockets, and maybe you will drive a rocket-propelled automobile.

By ROBERT N. FARR

See Front Cover

➤ TRANSOCEANIC rocket mail may one day carry letters from New York to London in little more than an hour, faster than any present-day cargo plane. Rockets, carrying delicate weather instruments, will be sent up vertically into the upper atmosphere to give meteorologists data upon which to predict the weather with greater accuracy.

Fishermen will have rocket harpoons to use in catching whales and other big game of the sea. Seamen will use rockets to throw lines from ship to ship, and from ship to shore to aid in rescue work.

Streamlined railroad cars, propelled by rockets, may carry you from city to city at speeds as high as 125 miles an hour. You may even drive a rocket- propelled automobile. Engineers are at work right now on a postwar automobile that has a set of rockets at the back to propel the car forward, and another set of rockets at the front to act as brakes.

Used for Centuries

Rockets for eight centuries have discouraged world rulers from pursuing their plans for world conquest. One hundred years before the invention of the gun, Kublai Khan and his Mongol invaders were on the receiving end of rockets fired by Chinese troops. In 1807 the Danish fleet was sunk at Copenhagen by a barrage of 25,000 British rockets. Napoleon at Waterloo was confronted by a British rocket brigade.

Rocket ships bombarded Fort McHenry in Baltimore harbor in 1814, and their red glare helped inspire the words of our national anthem.

The first effective rocket weapons, now in the hands of the Allies, are today confronting Hitler and Hirohito. Rocket research in the United States has made rapid progress as a result of close cooperation between the War Department, Navy Department, and the Office of Scientific Research and Development.

Working with these groups are two National Defense Research Committee groups; one with headquarters at California Institute of Technology, and the other located at George Washington University. In addition, the Army's Ordnance Department has a rocket research division at Aberdeen Proving Ground.

Rockets were carefully guarded "secret weapons" until they had been used against the Japs and until the Nazis felt their full force in the Normandy invasion.

Consist of Two Parts

Rocket weapons consist of two basic parts. The first is the head, containing high explosive, incendiary material, or smoke for a smoke screen. The second part acts as a motor. Unlike an ordinary motor, the rocket motor has no moving parts. Actually, it is just a tube containing a propellant, material which burns rapidly, and which may be either solid or liquid. One big advantage of rockets is that almost any material that burns fast enough can be used for a propellant.

The motor is closed at the forward end and has a nozzle opening at the rear. The rapid-burning propellant generates a large quantity of hot gas. The gas pressure in the motor chamber rises and exerts full pressure on the closed forward end of the motor chamber and only partial pressure on the nozzle end at the rear.

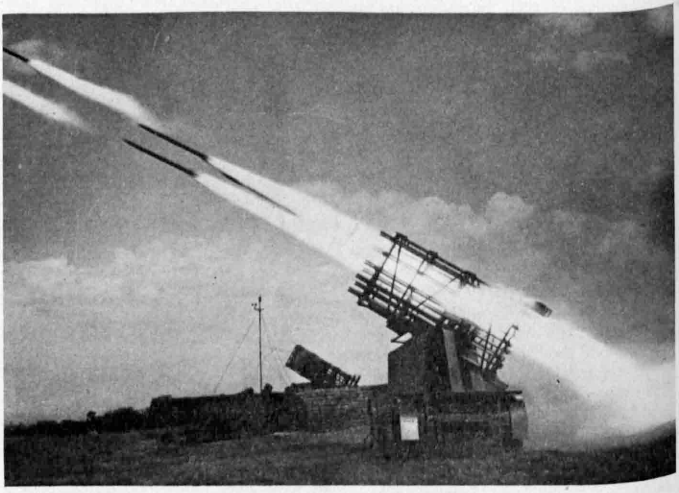
A forward force results, causing the rocket to move forward. Rocket motion is caused by the thrust against the closed end of the tube, not by the push of the gas on the air as it issues from the opening. As a matter of fact, a rocket operates better in a vacuum than in air.

Rockets are launched, not fired or shot from a gun like a bullet or shell. The rocket launcher, essentially a guide rail, directs the flight of the rocket itself.

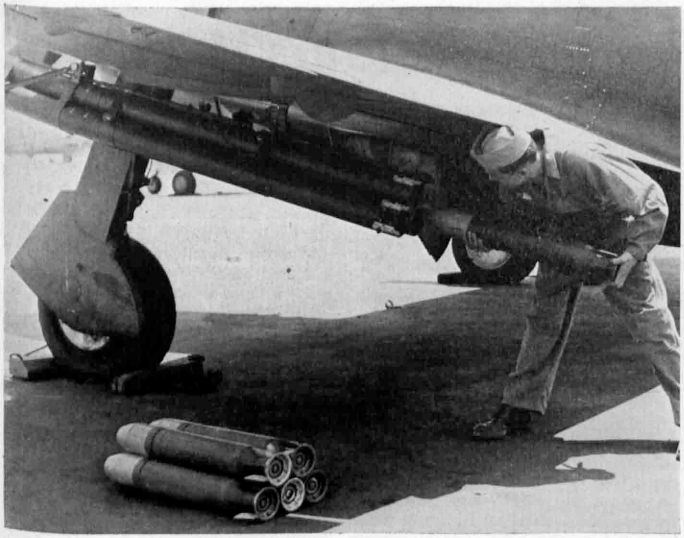
Rocket Launcher

In the case of the now-familiar bazooka, the launcher is a 5-foot hollow tube. Other types of rocket launchers are just frames, or long box-shaped affairs. Compared to guns, launchers are simple and lightweight, much less expensive to build.

Some rockets, like the bazooka projectile, travel at a rate of 260 feet a second, about as fast as a hard-batted baseball. Faster rockets move at about 1,600 feet a second. One high explosive rocket



WAR-WINNERS—Rockets, the results of extensive research, are today helping to win the war for the Allies. They literally melt the armor plate of a tank.



ROCKET LAUNCHER—This P-47 Thunderbolt carries deadly missiles under its wings. The rocket armament is being loaded with its projectile in this U. S. Army Air Forces photograph.

fired by a bazooka, sends a shower of molten metal into the night and makes a three-inch hole in the armor plating of the tank, seen in the Signal Corps photograph on the front cover of this SCIENCE NEWS LETTER.

Accuracy a Problem

One big problem facing rocket-development scientists is the accuracy of fire. It is this accuracy problem that must be solved before postwar applications, such as the ones mentioned above, would become realities.

The accuracy of rockets varies widely. If 1,000 bazookas are perfectly aimed at a point 500 feet away, over half of them will not miss the mark by more than one foot. Our armed forces, on the other hand, are using barrage rockets which are not intended to be accurate, but cheap. Hundreds of thousands of these can be made at home easily. In action they will blanket an area with smoke or shrapnel as well as if they were more expensive. In many rockets, accuracy is not worth the extra cost.

Method of launching, flight stability and quality of manufacture are the three general factors which affect rocket accuracy. Rockets must, of course, be accurately aimed and launched to hit the target accurately.

Rockets are given stability by using fins as on a dart, and by causing the rocket to spin like a top. With proper fins, a rocket will fly like an arrow, point first. If the rocket is too short, or the fins too small, it will wabble or yaw in flight. The more stable a finned rocket is, the more accurate it becomes. Rockets stabilized by spin must have just the right amount of spin. When the spin is too slow, it will tumble end over end, and if too fast, it will remain pointing in the direction of fire and fail to hit the target "nose on."

If a rocket is poorly made, the line of thrust of the motor will not pass through the center of mass of the rocket, and the projectile will be deflected off its course.

A rocket projectile, like the bazooka, weighing only a few pounds, can punch through six inches of tank armor. It literally melts the armor plate and showers hot fragments of steel on those inside the tank.

Bazooka rockets, the first U. S. rocket-weapon, are also effective against masonry pillboxes, for demolition work, and against motorized artillery. A GI bazooka blasted the turret right off a German tank with a single rocket from 225 feet.

Rocket projectors are mounted on almost any suitable vehicle or plane you might choose to name. They can be mounted on small amphibious landing craft, such as "ducks" and "alligators"; on practically all Army motor vehicles from jeeps to heavy trucks, and on practically all types of airplanes used both by the Navy and the Army.

The first U. S. planes to use rocket projectiles were two carrier-based Grumman Avengers. Early in January, 1944, they attacked a German U-boat and probably destroyed it with rockets, depth bombs and machine-gun fire. The latest flying bazookas have simple rocket tubes mounted under the wings in clusters, 3 projectors to each wing. They are launched singly or in salvo. Putting rockets on planes has the same result as putting wings on a field artillery piece—they pack the punch of a big gun.

In the shape of today's rocket may be seen the terrifying weapons of some future war. Rocket research must be continued after the war, under adequate professional control, so that we will be prepared for future wars with better offensive and defensive equipment. Let us hope that we can also benefit from the many useful peacetime applications of this unusual propelling power.

Science News Letter, November 11, 1944

Termites, which now destroy much lumber in homes every year, once were found almost solely in forests where wood to eat was plentiful; when forests were cut down the termites looked elsewhere for food.

Do You Know?

Vaporized silver has a greenish color.

Starfish prey upon one another.

Stiffness of *leaves* is due largely to water in their cells.

The life cycle of the *shrimp* is probably not over two years.

Chili is producing large quantities of *alcohol* as a by-product of the wine industry.

Meat, alive or dressed, may be brought into Mexico duty-free under a recent government decree to meet a shortage.

If the farm pond has too many *fish* for the food available they will all be small.

Swifts, swallows and whippoorwills fly with their mouths open to catch insects.

Soup-fin *sharks* weigh up to 70 pounds and yield from seven to ten pounds of liver each.

The pygmy *rattlesnake* seldom exceeds 18 inches in length, and being so small is much less capable of inflicting a fatal bite.

California *citrus fruit* growers claim increased crop yields when cultivation is not practised and the weeds are kept in control with oil sprays.

Toluene, the basic material for TNT, can now be made synthetically from benzine and methane, two cheap abundant substances found in oil and natural gas.

Analysis of various *coal ashes* has proved that traces of more than half of all the known chemical elements may exist in coal.

Australia produces normally approximately one-fourth the total amount of *wool* grown in the world; Argentina ranks second as a wool producer and the United States third.

Probably the northernmost operating *coal mine* in the world is a recently opened mine at Point Barrow, Alaska, on the Arctic ocean; it is expected to supply local needs of some 1,500 tons a year.

RADIO

Radio Amateurs Help War

As members of the Federal Communications Commission's Radio Intelligence Division, these "hams" have saved hundreds of lives and millions of dollars.

➤ RADIO amateurs, popularly known as "hams," are making an important contribution to the war as members of the Federal Communications Commission's Radio Intelligence Division. Among approximately 300 RID employees, 70% are licensed radio amateurs, reports Oliver Read, amateur radio operator of Chicago, Ill., in *QST* (Oct.), monthly publication of the American Radio Relay League.

The job of the RID is to police the airways, track down illegal radio stations, trap enemy spies, and most important of all—save human lives. Experience has shown that hams are ideally suited to the work which consists mainly of listening to stations over the entire radio spectrum.

These amateurs, the article states, man 12 FCC monitoring stations located throughout the U.S.A., its territories and possessions. Each station operates 24 hours a day, and a typical station has 16 staff members who watch the airlanes around the clock.

Hundreds of lives and millions of dollars' worth of airplanes have been saved by the skill of these hams. One station alone received an average of six requests a day for bearings on lost planes, the article reveals. It is the daily routine of these hams to search for aircraft that are lost, disabled, or forced down.

A typical "case history," reported by Mr. Read in the article, concerns an incident involving a transport plane lost en route to Miami, Fla., from Trinidad. Carrying 23 passengers, including a well-known movie star, the plane was reported overdue to the CAA, who notified the RID. Using radio location devices, and establishing its location beyond doubt, the RID notified the plane where it was. In less than one hour after the RID received notice of the lost plane, it had guided it to a safe landing.

The radio direction finder to get bearings on planes and radio stations is only one of the special types of equipment that the RID uses in its work. RID maintains and operates a continuous private line teletypewriter service covering the country and linking all monitoring stations with each other as well as with the east and west coast headquarters of the RID.

Another development is a selective sideband receiver which makes it possible to split the signals for two radio stations that overlap on the receiver. Two signals, for example, one from Germany and the other from South America, are split apart by the device, making it possible to hear either.

Each monitor station is equipped with recording apparatus, the article states, for making a permanent record of signals picked up on the air.

The RID has investigated 9,000 cases of alleged unlicensed or subversive stations in this country and elsewhere. Nearly 400 such stations have been located and put out of commission since July 1, 1940. More than 200 Axis spies have been rounded up in South America with the help of RID, the article asserts.

Science News Letter, November 11, 1944

From Page 311

questionable by usual standards often, though not invariably, "come around" when put in a group under a good sergeant or chief petty officer, Lt. Comdr. Howard P. Rome, U. S. Navy, told the meeting.

This observation, he said, brings up questions of leadership and group morale which are problems in peace as well as war, since group behavior is at the basis of strikes, riots, revolutions and stock market runs.

Science News Letter, November 11, 1944

METALLURGY

Water-Vapor Treatment Reduces Grain in Steel

➤ USE OF water-vapor in the atmosphere in which steel is heat-treated to increase its strength is the central idea in patent 2,360,868, assigned by the inventor, Maxwell Gensamer of Pittsburgh, to the Carnegie-Illinois Steel Corporation. The atmosphere commonly in use includes hydrogen; but Mr. Gensamer has found that the addition of water-vapor tends to abate the graininess of the metal and greatly reduce its yield point.

Science News Letter, November 11, 1944

AERONAUTICS

The New A-26 Invader Is Fastest All-Purpose Bomber

➤ FIRST facts about the A-26 Invader, the newest and fastest all-purpose bomber now being used by the Army Air Forces primarily to pave the way for invading troops, were revealed when the War Department lifted a corner of the veil of secrecy that surrounds the exceptional new plane.

The Invader combines speed, made possible with twin 2,000 horsepower Pratt and Whitney engines, and heavy firepower, which makes it a valuable weapon for use against enemy aircraft, ground forces, antiaircraft emplacements, supply dumps, wharves, and adaptable to almost any combat situation.

An unusual feature of the A-26 is the all-purpose nose that makes it possible to equip the plane on the production line with special devices for use on special missions, in addition to standard armament. This speeds up the time it takes to get the plane into the air, because it eliminates a trip to the modification center, where such devices are usually installed.

Details about the speed, range of operation, armament and other operational information are still being withheld. It is stated that the plane carries such an extremely flexible selection of machine guns, cannon, and bombs that its offensive striking power, particularly at low or medium altitudes, makes it a formidable weapon on the side of the Allies.

The A-26 employs the recently developed low-drag (laminar flow) airfoil wing section, a product of research originated and conducted by the National Advisory Committee for Aeronautics. This type of wing section was used first on the P-51 "Mustang" fighter plane. The characteristic of the wing section is that the greatest thickness of the wing has been moved back to about the middle of the wing. The leading edge is thinner than on most wings, and it has a teardrop trailing edge. The top and bottom halves of the wing appear to be nearly the same.

The A-26 also has a new double-slotted flap which reduces landing speed and assists take-off. The entire airplane features the accessibility to all parts, which simplifies maintenance. It is exceptionally "clean," aerodynamically.

It is now in mass production at plants of the Douglas Aircraft Company, the organization that fathered the A-26.

Science News Letter, November 11, 1944

CONSERVATION

NATURE RAMBLINGS
by Frank Thone

Creating A Resource

➤ CREATION of a brand-new economic resource for Chile, where nothing of its kind now exists, is the errand that has just taken William Vogt, chief of the conservation section of the Pan-American Union, southward to our neighbor republic. Mr. Vogt will be in Chile until early in February.

Guano, natural fertilizer especially rich in nitrogen, is the new resource for Chile that is expected to result from work to be done under Mr. Vogt's direction. Guano accumulates on off-shore islands where swarms of fish-eating sea birds nest, if there are enough of them and they are not disturbed too much.

Chile has the islands—hundreds of them. The islands have bird populations, mainly pelicans, cormorants and boobies. But in the past they have been consistently raided by unregulated collectors of eggs for the market, as well as the bodies of the birds themselves. Hence their populations have not grown to the point of profitable guano production; or on the few islands where any accumulation has taken place, again unregulated exploitation has removed it before there have been any really profitable quantities.

Conservation measures aiming at the increase of island bird populations include protection of the birds and their eggs against commercial "birders" and "eggers," inducing ships' officers not to sound their whistles so close as to scare the birds off their eggs, and keeping low-flying aviators away for the same reason.

Timing of legitimate guano collection is also of importance. It must not be carried on during the nesting season, lest the birds desert their eggs and thereby reduce the number of feathered "workers." In the past, thoughtless guano diggers have even assigned men the job of driving off the birds, so that they could carry on their work undisturbed!

Although Chile has islands with bird rookeries all along her tremendous coastline, only those of the section from Coquimbo north to Arica, or about one-third of the total, are regarded as good potential guano sites. South of Coquimbo the climate is so rainy that the nitrogen value is likely to be washed out about as rapidly as the guano is deposited.

Mr. Vogt has had previous experience in this particular field of research, having spent three years as an adviser of the Peruvian government on the problem. Recently he has aided the Mexican government in setting up a project for the establishment of guano islands off its coasts.

Science News Letter, November 11, 1944

AERONAUTICS

Experimental Licenses Show a 137% Increase

➤ INTEREST in aviation, and particularly in postwar flying, has been primarily responsible for a more than 137% increase in the number of experimental licenses issued during the first eight months of 1944 by the Civil Aeronautics Administration over the number of such licenses issued in the same period of 1943.

The experimental licenses issued total 38 and fall into three classifications: conventional planes, helicopters, and gliders. A number of the licenses granted for experimental conventional planes went to manufacturers of private or personal-type aircraft, including Piper, Taylorcraft, and Aeronca. Six different companies received licenses for the development of helicopters. A total of seven persons received licenses for experimental gliders.

Most interesting facts revealed were: that a shipbuilder applied for and received a license for an experimental helicopter, Higgins Industries, Inc., of New Orleans; a sheet metal stamper received a license for a conventional plane, Edw. G. Budd Manufacturing Company, of Philadelphia, who entered the aviation field last spring with the stainless steel "Conestoga" cargo plane; and a manufacturer of electronic tubes and equipment received a license for a conventional plane, Radio Corporation of America, of Camden, N. J.

Science News Letter, November 11, 1944

Portable *room-coolers* are expected to be common soon after the war.

Books of the Week

➤ FAMILIES AND FRIENDS of the disabled, as well as the disabled themselves, will find a practical guide to their problems in NORMAL LIVES FOR THE DISABLED by Edna Yost (*Macmillan*, $2.50). The author's straight-from-the-shoulder attack is likely to appeal to masculine readers particularly, but should prove equally stimulating to the handicapped of both sexes and all ages.

Science News Letter, November 11, 1944

➤ STAR-GAZING will become much more enjoyable after reading Lou Williams' A DIPPER FULL OF STARS (*Follett Publishing Co.*, $2). Beginning with the Big Dipper, the reader learns to recognize most of the important star groups of the Northern Hemisphere and becomes familiar with legends concerning the constellations. Although written for junior-high-school students, the whole family will enjoy this delightful, reliable introduction to astronomy.

Science News Letter, November 11, 1944

Just Off the Press

ANIMAL STORIES—Georges Duplaix with pictures by Feodor Rojankovsky—*Simon & Schuster, Inc.*, 91 p., illus., $1.50. A book for children—but for wise children; for many of the stories and rhymes have decided touches of irony in them.

AQUATIC PLANTS OF THE UNITED STATES—Walter Conrad Muenscher—*Comstock Pub. Co.*, 374 p., illus., $5.

ATOMS IN ACTION, THE WORLD OF CREATIVE PHYSICS—George Russell Harrison—*Garden City Pub. Co.*, 401 p., illus., $1.49, rev. ed.

THE BASIC TEACHINGS OF THE GREAT PSYCHOLOGISTS—S. Stansfeld Sargent—*New Home Library*, 346 p., 69c.

CHAMBERS' TECHNICAL DICTIONARY, Comprising terms used in Pure and Applied Science: Medicine: the chief Manufacturing Industries: Engineering: Construction: the Mechanic Trades—*C. F.* Tweney and L. E. C. Hughes, eds.—*Macmillan*, 975 p., $6, rev. ed.

CHEMISTRY OF ENGINEERING MATERIALS—Robert B. Leighou—*McGraw*, 645 p., illus., $4.50, 4th ed.

ESSAYS IN THE HISTORY OF MEDICINE PRESENTED TO PROFESSOR ARTURO CASTIGLIONI ON THE OCCASION OF HIS SEVENTIETH BIRTHDAY—Henry E. Sigerist, ed.—*Johns Hopkins Press*, 358 p., paper, illus., $3.50. (Supplements to the Bulletin of the History of Medicine, no. 3.)

INTO A SECOND CENTURY WITH PROCTER & GAMBLE—*Edward L. Bernays*, 50 p., illus., 10c.

LEGAL CONTROL OF THE PRESS—Frank Thayer—*Foundation Press*, 608 p., $4.50.

MALARIA: ITS DIAGNOSIS, TREATMENT AND PROPHYLAXIS—William N. Bispham—*Williams & Wilkins*, 197 p., illus. $3.50.

NAVIES IN EXILE—A. D. Divine—*Dutton*, 264 p., illus., $2.75.

OPTICAL METHODS OF CHEMICAL ANALYSIS—Thomas R. P. Gibb—*McGraw*, 391 p., illus., $5.

SNOWSHOE COUNTRY—Florence Page Jaques —*Univ. of Minn.*, 110 p., illus., $3.

THE VALLEY AND ITS PEOPLE, A PORTRAIT OF TVA—R. L. Duffus—*Knopf*, 167 p., illus., $2.75.

WHAT MAKES A WAR END—H. A. Calahan —*Vanguard*, 260 p., $2.50.

Science News Letter, November 11, 1944

AERONAUTICS

Civilian Pilot Accidents Stress Regulation Need

➤ ACCIDENTS to returned air heroes and other military pilots flying civilian planes with which they are not familiar has resulted in action by the Civil Aeronautics Administration. This action requires these returning pilots to prove complete adequacy for the type of flying involved.

The "conversion" of military pilots, whether they are on leave, discharged, or facing the eventual possibility of returning to civilian life, is a serious one. These pilots are eager to fly, and private plane owners urge them to fly their planes regardless of their ability to handle the slower and lower-powered "flying jeep."

Enough accidents have resulted to make it necessary for the CAA to appeal to private plane owners and military pilots alike to observe certain regulations.

Any pilot who has not flown a certain type of plane in three months is required to make five takeoffs and landings before he can take up a passenger. If he has not had solo experience within six months, he must take a check flight with an instructor.

Regardless of how proud the private plane owner is to have a war pilot take over the controls of his plane, with which he is most likely unfamiliar, the CAA urges that they refuse to permit any person to fly their planes who does not comply with the requirements.

To prevent fighter pilots from stepping into the cockpits of commercial planes and start flying passengers on the strength of their war record, civil air regulations require that the pilot prove that his military pilot rating is equal to the type and grade of pilot certificate he seeks by submitting a certificate from an appropriate officer proving his experience and competency as a military pilot. He must pass a written examination on civil air regulations, and submit a certificate of honorable discharge from the military services.

Once the ex-military pilot has passed these requirements, he still faces more rigid tests to prove his ability to fly passengers commercially. The airlines make their own examinations of applicants and they require their pilots to study and practise constantly, and all airline pilots are subject to check flights at any time by Air Carrier Inspectors of the CAA.

Even if commercial airlines requirements are multiplied many times, relatively few returned military pilots will be needed, and only the most experienced and best qualified will get jobs.

Science News Letter, November 11, 1944

Sea lion adults are called bulls and cows, but the young are called puppies.

• New Machines and Gadgets •

⚙ *NONSMUDGE lip protector keeps garments from becoming soiled from lipstick in dressing and undressing. It is an oval cup-shaped lip guard, made of rubber or some other flexible material, which is held over the mouth by a center stem grasped by the teeth.*

Science News Letter, November 11, 1944

⚙ *LIGHT-WEIGHT tent poles now furnished soldiers by the Army are made in three interchangeable sections of wood with metal caps and junction points of flat, cold-rolled, rust-resistant steel. The weight of the new pole is about one-half that of its predecessor, and it takes less space in the soldier's pack.*

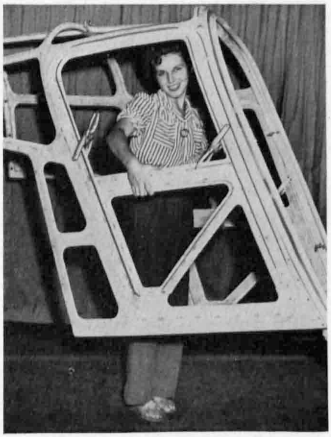
Science News Letter, November 11, 1944

⚙ *PLASTIC screw top for nursing bottles has a center opening in which the rubber nipple fits, projecting either outward for the baby's use or into the bottle while in the refrigerator. The sterilized nipple placed inverted in the bottle remains sterile and its position may be quickly changed.*

Science News Letter, November 11, 1944

⚙ *PORTABLE power saw for cutting metals, plastics and other materials is provided by an attachment for the ordinary hand-held electric drill so that a common hacksaw blade may be substituted for the drill. The apparatus may be used for power filing by inserting a file in the same chuck or holder.*

Science News Letter, November 11, 1944



⚙ *COMPLETE cabin structure of helicopters being built for the Army, shown in the picture, is made of light-weight, strong, rigid, laminated plastic that is capable of withstanding strains and excessive vibrations. The plastic does not conduct electricity, and is not affected by oils, acids and most alkalis.*

Science News Letter, November 11, 1944

⚙ *TOBACCO pipe, with a wedge-shaped movable piece in a slot between the bowl and stem, permits smoking without cooking the tobacco in the bottom half of the bowl. The wedge is moved down or up with a thumb screw, leaving an opening above or below it. The smoke is drawn through the upper slot until the top tobacco is consumed.*

Science News Letter, November 11, 1944

⚙ *MULBARO is a wheelbarrow with a circular metal shallow bowl into which sand in a foundry is put for mulling, mixing and muddling. In use the loaded mulbaro is run under an electrically operated mulling unit, which is quickly lowered over the bowl, fitting it closely. Rubber-covered rollers squeeze, knead and aerate the sand.*

Science News Letter, November 11, 1944

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 233.

Question Box

AERONAUTICS

What is the "Firefly"? p. 312.

What is the name of the new all-purpose bomber? p. 317.

CHEMISTRY

How does cadmium aid camouflage paint? p. 313.

ENTOMOLOGY

How was an entire island sprayed with DDT previous to troop landings? p. 310.

INVENTION

How does water-vapor aid steel? p. 316.

MEDICINE

What anesthesia was used in the recent Caesarean birth of quadruplets? p. 312.

What are the prospects for further nerve activity research? p. 309.

What is the suggestion for intensifying the cancer fight? p. 310.

What research work is yet to be done on vitamin K? p. 307.

What is the newest use for fibrin film? p. 311.

NUTRITION

What is the new food tray galley? p. 308.

PHYSICS

How may color be transmitted by wire? p. 308.

PSYCHOLOGY

How may psychologists in the Army obtain commissions? p. 312.

PUBLIC HEALTH

When is DDT apparently entirely safe to use? p. 310.

RADIO

How are radio amateurs helping to win the war? p. 316.

Where published sources are used they are cited.