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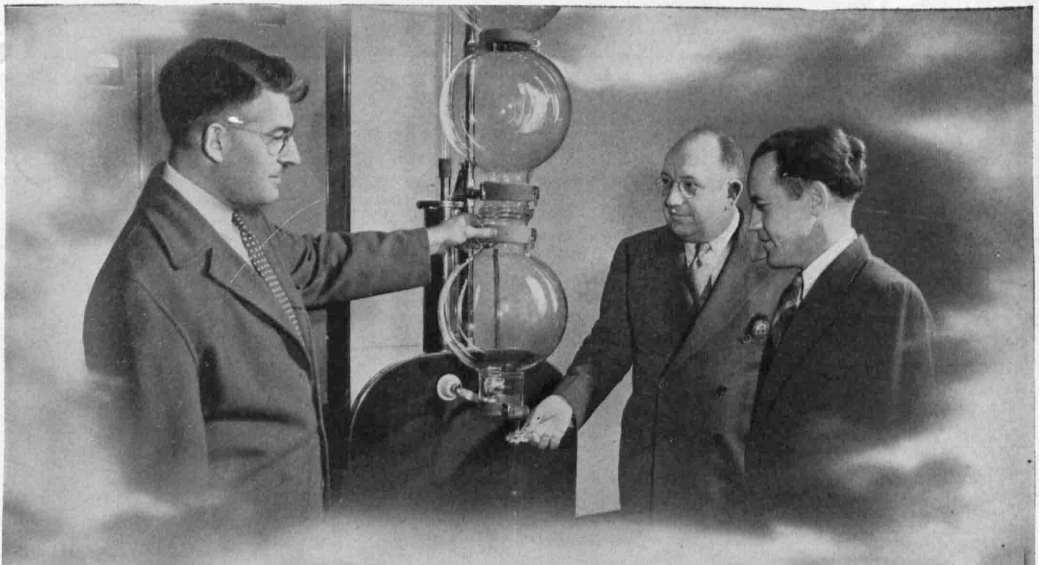
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • AUGUST 19, 1944

Solves Problems

See Page 123

A SCIENCE SERVICE PUBLICATION



New RCA Penicillin Process Speeds Production!

• TODAY, when the wonder drug penicillin is so vitally needed on the fighting fronts and in home-front sickrooms, the Radio Corporation of America reveals that a revolutionary method of production has been perfected in RCA Laboratories.

Tests at the new Squibb penicillin production center at New Brunswick, N. J., show that one RCA electronic installation can concentrate 2,000,000,000 Oxford units of penicillin in 24 hours—enough for 100,000 individual cases. This represents a considerable reduction in total production time.

Besides streamlining the elaborate evaporation method, the RCA electronic system includes these important advantages: reduction of operating costs, lowered maintenance costs, less possibility of mechanical difficulties and production delays, great savings in floor space, and impressive reduction in initial equipment costs.

The new RCA electronic dehydrator of penicillin is shown here in operation at E. R. Squibb & Sons. This apparatus may be purchased from the RCA Victor Division, Radio Corporation of America, Camden, N. J.

RADIO CORPORATION OF AMERICA

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RCA leads the way in radio—television—phonographs—records—tubes—electronics

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ELECTRONICS

"Lighthouse" Tube

New disk-seal electronic tube has given the Allies a decided edge over the Axis in the military radio field. Will relay FM and television after war.

➤ A NEW DISK-SEAL electronic tube, widely known among radio engineers as the "lighthouse" tube, has given the Allies a decided edge over the Axis in the military radio field. In the postwar world, these tubes will make possible the radio relaying of FM radio and television programs. New information about this tube has been released by the Army and Navy.

The lighthouse tube, known to engineers as a megatron tube, greatly advances the frequencies and power available for use in the electronics field. It has made possible a new family of ultra-high frequency electronic tubes, circuits, and apparatus which now operate in parts of the radio spectrum impractical of use before the war. The military services will not permit specific information to be given on circuits or apparatus in which the tubes are used.

The new tube eliminates the conventional type of grid, anode and cathode. Instead of components being fitted around one another as in the past, they are now constructed in parallel planes or layers, with glass and metal fused in rigid, inseparable units that are capable of withstanding severe handling. This design permits an extremely compact overall tube structure, and at the same time high frequency and high power output.

As radio engineers progressed up the scale of the radio spectrum to the higher frequencies, it became more difficult to produce electronic tubes and apparatus having adequate power to perform the desired service. As frequencies became higher and wavelengths shorter, the electronic tubes became smaller, and their ability to produce enough radio power became less. The parallel plane construction of the lighthouse tube makes possible the production of high frequencies at sufficient power, and also makes available many high and ultra-high frequencies from which one may be selected for a particular service (television, FM, radar, etc.), and used without interference by others.

The Naval Research Laboratory and the Camp Evans Signal Laboratory were among the first government groups to make use of the early applications of this tube, which was developed by the General Electric Company's Electronic Laboratory.

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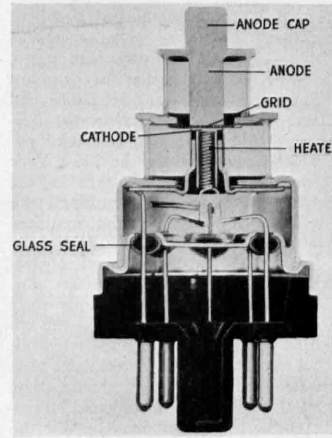

"LIGHTHOUSE" — This new disk-seal electronic tube, known to engineers as a megatron tube, developed by the General Electric Company's Electronic Laboratory, greatly advances the frequencies and power available to electronics and makes possible a new family of ultra-high frequency apparatus.

RADIO

Radio For Railroads

Expected to increase efficiency, speed operations, and insure safety. Federal Communications Commission will begin hearings on Sept. 13.

➤ A NEW APPLICATION of radio to increase efficiency, speed operations, and insure safety on railroads will be the subject of hearings before a committee of the Federal Communications Commission to begin Sept. 13. Interest in the use of radio by railroads has reached an all-time peak, as witnessed by the fact that over 37 applications for two-way radio equipment development have been filed with the FCC, since January. Some permits have already been granted.

"These hearings are for the purpose of developing information which may be of assistance and guidance to all parties in carrying out their further programs on the use of radio on railroads. Although no immediate determination of policy is contemplated, the present investigations may herald a new era of railroad safety," reported James Lawrence Fly, chairman of the Federal Communications Commission, in an interview.

"The applications now pending before the FCC cover two-way radio communications between the dispatcher and trains in motion, between trains, and between the head-end and rear-end of each train. The use of 'walkie-talkie' for flagmen and brakemen is also contemplated," Chairman Fly explained.

"All of these services involve two-way radio communication as distinguished from carrier-current systems which transmit through the rails or other metallic circuits adjacent to the tracks, using low frequencies," he stated.

"The fact that today radio traffic control methods are used in directing the movement of railroad cars carrying high explosives is proof of the safety of the method. It has been stated that an engineer in a radio-equipped engine can do in three minutes with radio what he would otherwise take 15 to 20 minutes to do. Radio may be of great help in bottleneck freight yards where you now have to depend on flag, lantern, or messenger signals. Operation would be more efficient because the engineer can acknowledge receipt of information and ask questions. In the event of derailment or other emergency, train crewmen would be able to cary on two-way communication with the nearest control point," Chairman Fly predicted.

"It is possible that many terrible rail-

road accidents could have been averted," he said, "if radio equipment had been available."

"As I see it," Chairman Fly stated, "radio if put into regular use on trains will supplement existing telephone and telegraph equipment, rather than replace it. Although radio was tried out experimentally first by the New York Central Railroad as early as 1925, the railroads have not been as quick to take advantage of radio as the maritime world and the aviation industry.

"The FCC is very sympathetic regarding the need of radio for safety purposes by the railroads, and stands ready to grant applications as long as the operation requested will not interfere with other communications. At the same time we feel that the initiative should come from the railroads, and to avoid crowding of the channels it may be that the railroads will have to work out some joint communications system," Chairman Fly made clear.

"Use of FM radio in lieu of standard broadcast for railroad communications is a possibility. FM will not be affected by high interference levels in Diesel-electric locomotives, and in addition to operation in railroad yards, it can operate for intra- and inter-train communications on main lines. Practicable means may be found to use radar in the future to warn engineers of the approach of another train. With radar an engineer will be able to 'see' a train on the track ahead at a long distance," he stated.

Chairman Fly predicted that radio might some day be used to break the present wall of isolation between rail travelers and the outside world. "Radio could provide two-way telephone communication from moving trains, radio and television could give travelers entertainment, thus combining a safer and speedier trip with all the comforts of a modern home," he said.

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CHEMISTRY

High Altitude Treatment

The combination of dilantin and thiouracil has been found effective on rats; were able to survive at 39,000 foot altitude.

➤ COMBAT PILOTS may some day be given a combination of two common chemicals to protect them against death in case their oxygen supply is cut off at high altitudes, if animal experiments conducted at New York University are found to apply to humans.

Dilantin sodium, medicine that is given to epileptics to prevent seizures, will enable rats in a pressure chamber at simulated high altitudes to survive three times as long as untreated control animals, it is reported (*Proceedings, Society for Experimental Biology and Medicine*) by Dr. Harry A. Charipper, Dr. Albert S. Gordon, and Dr. E. D. Goldsmith of Washington Square College.

In previous experiments, the same investigators had found that thiouracil would also increase the resistance of the animals to about the same extent.

But when both drugs are used in combination, the animals were able to survive 12 times as long as animals without this treatment. Of 17 animals treated with both drugs, 14 were able to live for two hours at an altitude of 39,000 feet.

It is believed that the dilantin sodium acts by stimulating the nerve cells controlling heart and lungs, the thiouracil by working directly on the thyroid gland and slowing up the process of living by which the animal's food is changed into energy.

The drugs in combination give considerable protection to the lung tissue, the investigators report. Animals treated with them had very little hemorrhage or none at all.

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ENGINEERING

Rocket Society Announces 1945 Technical Sessions

➤ ANNOUNCING that meetings of interest to rocket and jet propulsion engineers, technicians and experimenters, will be held during the coming year, the American Rocket Society has also published the names of its new officers. James H. Wyld, engineer of Reaction Motors, is the new president, while Roy Healy, engaged in technical work for the armed forces, is vice-president, Dr. G. Edward Pendray of Westinghouse Electric & Manufacturing Co. is secretary, Cedric Giles of New York Telephone Company is editor of Astronautics, and Dr. Samuel Lichtenstein is treasurer.

Regular meetings of this pioneer organization of rocket experts, organized in 1931, were suspended during the past two years because most of the members have been engaged in confidential war work that is now being felt by the enemy on battlefields.

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PUBLIC HEALTH

Good Health Record

Death rate from disease is lower in the Army than in the last 10 peacetime years. Board of civilian experts helped check epidemics.

➤ THE ARMY has set a new health record in the history of wars, thanks in part to a "fire-fighting organization" of eminent civilian scientists, the War Department announced.

The death rate from disease in the Army is now not only lower than it was in the World War but lower than in any of the last 10 peacetime years.

The organization which has helped give this health protection to American soldiers all over the world is the Board for the Investigation and Control of Influenza and other Epidemic Diseases in the Army. With its 10 subsidiary commissions, this board functions under the Preventive Medicine Service of the Office of the Surgeon General.

The foresight of Brigadier General James S. Simmons, chief of the Preventive Medicine Service, led him to suggest organization of the Board in 1940, long before Pearl Harbor and at the time the Selective Service program was just getting under way. Memory of the 1918 influenza epidemic and of other serious epidemics of contagious diseases during the World War, plus the Army's tradition of utilizing the services of the most competent available specialists in the nation to fight infectious diseases, led to the suggestion for the board.

The Secretary of War authorized the creation of the board in January, 1941. Since then its members have stood ready, like fire-fighters, to make a run to any scene where their services are required. Often they are on their way to Army camps or posts within a few hours after their presence is requested. As a result many incipient epidemics have been checked and much information of value to every Army post has been collected.

Use of a protein from blood plasma to prevent measles; development of a technique for oiling floors, blankets and sheets to trap germs in hospital wards and barracks; discovery that small daily doses of sulfadiazine will eliminate meningitis germs from noses and throats, thus checking the spread of the disease; investigations indicating that influenza A and B may eventually be controlled by vaccination are among the accomplishments of the board and its commission as listed in the War Department's announcement.

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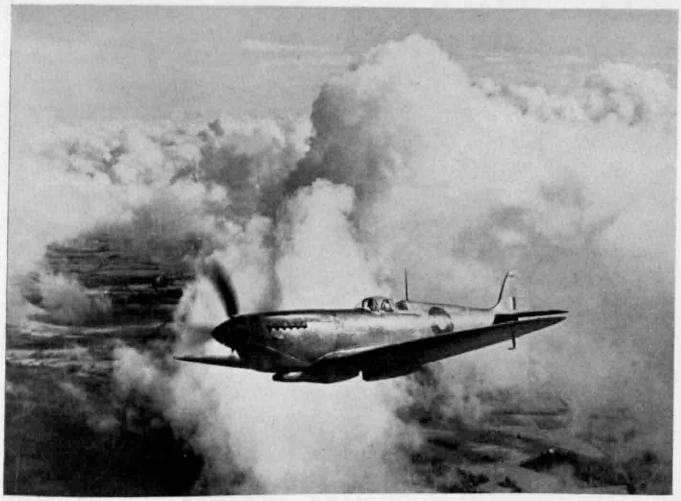

ARMY "EYES"—The Spitfire, shown in this official British photograph, is an all-metal single seat, low wing monoplane, specially designed for photograph reconnaissance duties. The cameras are fitted in the fuselage.

AERONAUTICS

Fighter Plane Equipped For Photo Reconnaissance

➤ DETAILS of the latest version of the R.A.F.'s best fighter plane, the Spitfire, have been released in London. The new plane, designated the Spitfire PR Mark XI, is an all-metal, single-seat, low-wing monoplane equipped with cameras in the fuselage for photo reconnaissance work.

The Mark XI is powered by a Rolls Royce Merlin engine of more than 1,650 horsepower. An engine of this power will enable a plane to be thrust through the air at speeds greater than 350 miles an hour. It has a four-blade constant speed propeller, and hydraulically operated retractable tail wheel.

The wingspan of the Spitfire Mark XI is 36 feet 10 inches; it is over 31 feet long, and stands 11 feet 8 inches high.

Spitfires played an important part in defeating the Luftwaffe in the Battle of Europe. Their speed, rate of climb, and maneuverability have won for them praise from all Allied airmen.

The new photo-reconnaissance Spitfires will have duties similar to those of the U. S. P-38, which just recently was equipped for this type of work.

Photo reconnaissance supplies information regarding the strength of enemy troops, the placement of enemy weapons, the location of enemy airports and the results of bombing on enemy targets, as well as other vital intelligence necessary to the planning of our own action against the enemy.

These planes carry special camera equipment with the speed of the shutter and the plane synchronized, enabling the fast flying planes to take pictures at speeds above 400 miles an hour. All that the pilot has to do is push a button and the camera works automatically. The cameras themselves frequently have unusual equipment included in the body of the camera to record on the negative the time of day, date, serial number of the negative, speed, altitude, angle of the camera and other pertinent data.

Photo reconnaissance planes are usually unarmed, making their missions over enemy territory particularly dangerous.

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AERONAUTICS

New Air Laboratory

Will conduct researches on aircraft fuel systems, hydraulic controls and anti-icing equipment at altitudes up to 10 miles.

➤ A NEW experimental research laboratory, recently opened in Cleveland, will study problems involving aircraft fuel systems, hydraulic controls and anti-icing equipment at the extreme atmospheric pressures and low temperatures of altitudes up to 10 miles high.

The laboratory, a part of the Pesco Products Company, is fully equipped to duplicate all conditions met while flying up to 50,000 feet. The equipment includes a huge cylindrical altitude chamber, duplicating conditions within the airplane cabin, for testing products. Since equipment is frequently exposed to tropic-like heat when close to over-heated engines, a special pyrometrically controlled oven for running heat test has been installed in the room. Airplane parts may be heated to more than 100 degrees above zero Fahrenheit, while the surrounding atmosphere is as much as 85 degrees below zero Fahrenheit.

In the hydraulic laboratory there is a "burst chamber" in which pumps used in aircraft are literally blown apart to determine how much hydraulic pressure may be exerted on the pump safely.

Without curtailing research on vital warplane equipment, the laboratory is already adapting some of its wartime discoveries to commercial use. One new development is a hydraulic clutch actuator that features self-adjusting action, providing greater ease of operation, and reducing by nearly 50% the normally required foot pressure on the pedal. This unit is designed for use on trucks, buses with rear engine drives, marine installations for remote power control and reverse gear shift, and other similar applications.

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AERONAUTICS

New German Planes

Newest one has a very fast rate of climb and is jet propelled. Different from "flying bomb" in that it has a pilot.

➤ THE NAZI single-seater fighter plane, first seen over England in April, and more recently in small numbers by both the Royal Air Force and the Army Air Forces, is jet-propelled, but may also have rockets to help boost it up to sufficient altitude. The past history of German aeronautical development indicates that we may expect several new models of this plane within a short time.

While there is no record of one of the new jet-propelled planes being shot down or captured, from reports of those who have observed them in the sky we can tell a good deal about them. They are completely different from the "flying bomb" being used over England, and the glider-bomb used in the Mediterranean, in that they are flown by pilots, and can be navigated like any ordinary fighter plane.

The Nazi plane has a very fast rate of climb, which gives strength to the contention that rockets are used to boost it to high altitudes. The plane, probably, takes off with the jet-propulsion motor and rockets. After reaching an altitude of 20,000 feet the pilot may turn off the engine, extending its life in the air and duration of flight by gliding. It is unlikely that it would be able to fly at full power for more than five minutes without burning up all its fuel.

Something new in aerodynamic design may be supposed, since no known jet-propelled plane can maneuver without its engine operating. The German love for unorthodox design in aircraft may have made possible a cross between a jet-propelled plane and a highly maneuverable glider.

The maximum speed of the new plane is probably not more than 500 miles an hour, making it an easy target.

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FOLDING BAZOOKA—The new version (left) can be quickly and simply assembled and is much more convenient to carry than the older type weapon (right). Official Signal Corps photograph.

ORDNANCE

"Flying Bazookas" Increase Fighter Planes' Power

➤ ARMY ORDNANCE rockets, known also as "flying bazookas," are increasing the striking power of the Army Air Force fighter planes in the Far East.

The rockets, discharged from tubes under the wings, are being used in combination with depth charges for attacks on shipping and submarines, and with bombs for ground targets. Pilots have little difficulty in learning how to fire the new rockets.

Stationary targets, such as buildings and warehouses, can be hit by firing the rockets one at a time. One AAF pilot set five Jap warehouses afire in six tries. For moving targets, such as locomotives or enemy aircraft, pilots usually let go all rockets at once, thus practically insuring a hit.

Rocket launching tubes in no way interfere with normal combat missions where no rockets are used. Experience thus far indicates that rockets have set fire to ground targets and are good weapons for fighters to carry when on sudden low-level surprise attacks against enemy airfields.

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A tuberculosis *clinic on wheels* equipped with X-ray and other essentials, is operating in Portland, Ore., and Multnomah county; it will do follow-up work among contacts.

MILITARY SCIENCE

Better Selection

4F's rejected for educational reasons will be given a new test to determine ability to absorb military training.

➤ THE NEW TEST that is to be given at induction centers to men now in 4F classification for educational or mental reasons is a kind of intelligence test, it is revealed by Army sources. It is not a test of education or of mental health.

Army officials do not call it an intelligence test, however; they call it a test of "ability to absorb, mentally, military training."

The new test is believed to be fairer and more accurate than the test previously used because it samples a larger range of abilities and because it permits closer contact between the examiner and a greater number of selectees.

It is not expected materially to increase or decrease the acceptance rate. At present, Selective Service reports, 13.8% of those rejected are considered unsuited to military service for mental or educational reasons. But it is hoped that fewer men will be rejected who would actually prove capable of getting along in the Army if they were given a chance. It is also hoped that fewer will be accepted who later have to be rejected.

Early in the days of the draft, the Army was rejecting large numbers of men because they could not read and write or meet other educational requirements. They are not rejecting any man solely on this ground, today. If he is bright enough to learn his military duties, he can go into the Army whether he has ever had a day's schooling or not.

The new test, it is hoped, will give Army examiners a pretty good idea about his ability to do this particular kind of learning.

Men in 4F because they are not emotionally suited to military service, or because they are not in good mental health, will not be included in the group of those called up for re-examination. This is a larger group than those who are mentally or educationally deficient, representing 18.3% of all rejections according to present figures.

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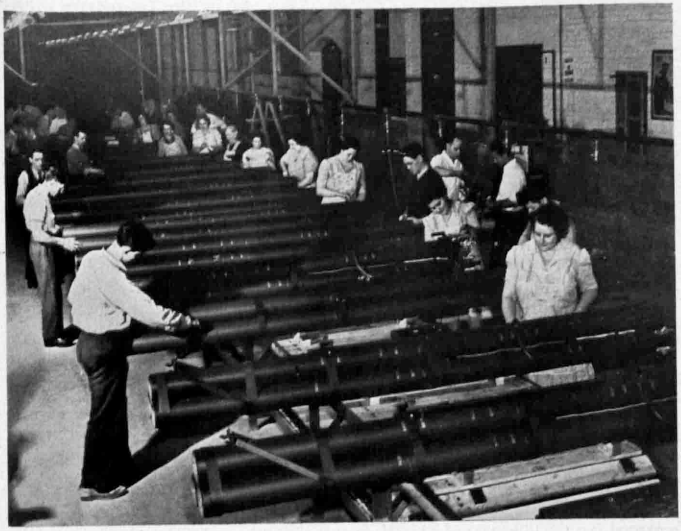

***FLYING BAZOOKAS**—The air-minded cousin of the famous infantry gun is made on a mass-production basis at the plant of the General Electric Company. The rocket tubes are mounted in groups of four under the wings. See SNL, July 15, for a photograph of the rockets in flight.*

MEDICINE

Coolness for Treatment of Shock Is Advocated

➤ MEDICAL scientists are getting farther and farther away from the idea of using heat in treatment of patients suffering from shock. As every first aider knows, the first rule for treatment of shock used to be to apply heat. You wrapped the patient in blankets or coats, surrounded him with hot water bottles, gave him something hot to drink if he was conscious.

Then, about a year ago, came warnings that such treatment would overheat the patient and aggravate the trouble. In shock, it was pointed out, the tiny blood vessels near the skin are constricted. This leads to the cold, clammy skin which may have been the original reason for applying heat. But the blood vessel constriction was believed to be a defensive mechanism to make up for the decrease in blood volume during shock. Applying heat defeats the purpose of this natural defense mechanism by dilating the vessels so that more, instead of less, blood must flow into them.

Following this line, doctors advocated keeping the patient comfortably warm by wrapping him in blankets, but not heating him up by hot water bottles and the like.

Now comes a report from Western Reserve University that low temperature rather than warmth may be the best treatment for shock, at least of the kind that comes from crushing injuries such as war wounds. The report is based on studies by Dr. Harold D. Green, of Western Reserve, and Dr. Georges A. Bergeron, of Laval University, Quebec. Animals in shock from injury were helped to survive, nine out of 14 of them indefinitely, by being kept in a room at a temperature of about 50 degrees Fahrenheit.

The beneficial effect of the cool temperature, the scientists believe, is due in part to lessening the damage to crushed tissues during the period of compression and in part to decreasing metabolic demands on the blood circulation. They suggest keeping shock patients in as cool a place as is reasonably comfortable, avoiding both heat and extreme cold.

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STATISTICS

War Reduces Suicides to Low Level in United States

➤ THE WAR has reduced the number of people who take their own lives, in the United States.

Suicide statistics on the Metropolitan Life Insurance Company's industrial policyholders show that the 1944 death toll from suicides is being further reduced from the low record of 6.8 per 100,000 in 1943. The figures for 1941 and 1942 were 8.2 and 7.7. In the two years following Pearl Harbor the suicide rate was lower by about a fifth than the rate for the preceding three years. As in the last war, the downward trend began about the time of the outbreak of the conflict in Europe, before the United States entered the fighting.

The general decline in the suicide rate in recent years is attributed to favorable economic conditions and the psychological effect of the war.

Even now suicide takes considerably more than 13,000 lives a year in the United States, but through advances in psychiatry it is hoped that this social wastage can be prevented in the future.

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MEDICINE

932 New Polio Cases As Epidemic Spreads

➤ INFANTILE PARALYSIS cases showed another pronounced increase, with a total for the country as a whole of 932 new reports during the week ended Aug. 5, as compared with 738 for the preceding week. Increase in number for the week was 194, as against the preceding week's increase of 170 cases. The only state not reporting was Arkansas, but this is not expected to affect the total materially, for no new cases had been reported from there for the past two weeks.

While a recession has apparently begun in North Carolina, hitherto one of the worst-afflicted states, the northeastern quarter of the country is now hardest hit, with severe increases in New England and the Middle Atlantic States, as well as the border state of Virginia.

For the New England group, 36 new cases were reported during the week, as compared with only 12 for the week before. Most of these were concentrated in two states: 23 in Massachusetts and 10 in Connecticut. There was a big jump in New York, with the number of cases going up from 237 to 311—67 of them in New York City alone. Pennsylvania showed an increase from 64 to 86, and New Jersey one from 3 to 16. Virginia had 63 new cases, as compared with only 39 for the preceding week.

The West is almost free of the disease: only four cases in the vast area represented by the eight Mountain states, and a very low incidence also in the three Pacific Coast states.

A new low in smallpox reports was turned in by agencies reporting to the U. S. Public Health Service: only one case during the week for the whole country—it occurred in Idaho. Thus far this year only 288 smallpox cases have been reported in the United States. This is less than half the comparable figure for 1943, which was 600; and 1943 marked an all-time low up to that date.

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GENERAL SCIENCE

Academy of Sciences Receives Ordnance Award

➤ THE NATIONAL ACADEMY of Sciences, official liaison agency between American scientists and their government, has been designated to receive the Ordnance Distinguished Service Award of the U. S. Army. Formal presentation of the diploma will be made in connection with the next meeting of the Academy.

In a letter to Dr. Frank B. Jewett, president of the Academy, Maj. Gen. L. H. Campbell, Jr., Chief of Ordnance, says:

"It is my pleasure as Chief of Ordnance of the Army to tell you on behalf of the Ordnance Department that I am most grateful for the outstanding contributions the National Academy of Sciences has made to Ordnance progress in this war. The degree of that progress is best shown by the success of our fighting forces in all theaters of operations."

The National Academy of Sciences was founded in 1862, with the signature of Abraham Lincoln affixed to its charter. It was intended as the agency to make the services of American scientists more efficiently available to the government. During the nearly three generations of its existence, it has come to be regarded as the "Senate of American Science," with election to its membership one of the most distinguished honors which an American scientist can receive.

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IN SCIEN

CHEMISTRY

Natural Gas Synthesized To Produce Diesel Fuel

➤ A HIGH cetan Diesel fuel, produced from a fluid obtained by synthesizing natural gas, is now being tested by the Navy Department to determine its value as a fuel for combat service. Cetane is used as a gauge for diesel fuels as octane is used for gasoline.

The immediate use of the new fuel lies in improving the quality of low cetane fuels and augmenting the present supply of fuel for the many Diesel ships in the Navy. In the future it may mak 100 cetane fuel practicable where 50 cetane fuel is now the average for high quality Diesel fuel.

A cheap source of the basic high cetane fluid is natural gas, now vented into the air or wasted. The process by which the fuel is produced employs catalytic technology developed by the synthetic rubber and aviation gasoline programs.

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CHEMISTRY

Rust Preventive Keeps Invasion Craft in Trim

➤ THE NAVY'S new thin-film rust preventive keeps landing craft ready at all times for the "go ahead" signal.

The new preventive protects engines and other vital moving parts against damaging corrosion which might result during construction and long ocean voyages and from local climatic conditions in widely-separated fighting fronts.

Thin-film treatments, developed by the Navy Department's Bureau of Ships and the Bureau of Aeronautics, have a remarkable ability to displace water from metal surfaces, and do not have to be removed from the treated surfaces of engines and moving parts before the craft are placed in service.

The actual compositions of the new thin-film compounds are not revealed at the present time.

Thin-film coatings do away with the old time-consuming process of removing "thick" coatings of ordinary grease before vessels are placed in service.

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E FIELDS

CHEMISTRY

Milk Bottles Sterilized By Ultraviolet Radiation

➤ ULTRAVIOLET ray sterilization for the insides of milk bottles and other containers is provided by apparatus on which an English inventor, C. B. Harley of London, has receieved patent 2,352,787.

The ultraviolet radiation is provided by quartz tubes carried at the lower ends of pistons. When a bottle has been placed in a chamber under such a tube, the air is partially exhausted, which causes the piston to descend, lowering the tube into the bottle. Current is supplied through coil-spring conductors, which automatically lift the tube out again when air is re-admitted to the chamber. This method, the inventor points out, eliminates the jolts and jars inherent in mechanical systems for lowering and raising the ultraviolet tubes, thereby prolonging their useful life.

Science News Letter, August 19, 1944

MEDICINE

Arm and Leg Wounds Not Greater Than in Past Wars

➤ WOUNDS in arms and legs are no more numerous, as compared with total casualties, than they were in the American Civil War, and they are somewhat less numerous than they were in World War I, reports of Army surgeons indicate. Arm and leg wounds now constitute 70% of all battle injuries; during the Civil War the figure was 70.8%, and for World War I it was 76.5%.

Land mines, exploding when stepped on, are responsible for many of the worst leg injuries in the present war. Their effects are frequently so crushing that amputation is the only recourse.

In any wound less than complete mangling, however, the patient's chances of recovery are much better now than they used to be, the reports indicate. Plasma, penicillin and the sulfa drugs are three keys to this improved state of affairs; and improvements in surgery, especially nerve surgery, constitute a fourth.

When there has been a bad nerve severance, which happens in about 12% to 15% of arm and leg cases, the field surgeon does not attempt to make repairs on the spot. He merely connects the broken nerve ends with a strand of tantalum wire, which can be embedded in the flesh without causing irritation, and speeds healing of the wound by every means available. Later, usually at a general hospital in this country, surgeons locate the tantalum-wire "tags" by means of X-rays and perform a special operation to reconstruct the severed nerve trunk.

Science News Letter, August 19, 1944

STATISTICS

500 Killed Annually In Falls From Windows

➤ SOME 500 persons are killed each year by accidental falls from windows. About 400 of these deaths occur in the home, particularly during the summer when windows are open, a report from the Metropolitan Life Insurance Company states.

Parents are likely to let their children roam around near windows too freely. That many a youngster is killed by leaning against a window screen and toppling out when the screen gives way is revealed by a study of the deaths listed with the company from 1940 to 1943.

Washing windows, sitting on sills, and merely opening and closing obstinate windows have caused the death of many adults. Even thieves trying to break in have been victims of death from accidental falls of this type.

Science News Letter, August 19, 1944

STATISTICS

Civilian Death Rate Low Despite Third Year of War

➤ THE DEATH rate among civilians is "extraordinarily favorable" although the nation is well into its third year of war, figures based upon the Metropolitan Life Insurance Company's industrial policyholders show for the three months, April through June.

The mortality rate, exclusive of enemy action, was 760 per 100,000 which is 3½% below the corresponding rate of last year and lowest for any like period of any year except the record health years of 1941 and 1942.

This good record was set despite the bad start for the year when in January, due to a respiratory disease epidemic, the civilian death rate was the highest since 1937. This is considered evidence that the war has not seriously disrupted the health services on the home front.

Science News Letter, August 19, 1944

MEDICINE

Get Copperplated Feet To Stop Athlete's Foot

➤ LEATHERNECKS and sailors are getting copperplated feet to stop athlete's foot, Sergeant Alvin M. Josephy, Jr., a Marine Corps Combat Correspondent in the South Pacific reports.

The copperplating is a form of treatment which Navy doctors have found so successful in banishing the troublesome fungus infection that they believe further use of the method is warranted.

The patient places his feet in a copper sulfate solution containing an ordinary copper plate. Copper bands, soaked in salt water for good contact, are fastened around the ankles and connected to six-volt storage batteries.

Treatment takes about six minutes and is repeated for six or seven days. Although copper particles temporarily adhere to the patient's feet, there is neither discomfort nor discoloration.

Science News Letter, August 19, 1944

ENGINEERING

Postwar Cars and Trucks May Have Aircraft Engines

➤ ADAPTATION of aircraft-type engines for commercial vehicles is a postwar possibility, Vincent C. Young of the Eaton Manufacturing Company, told the Society of Automotive Engineers National War Materiel Meeting in Detroit.

Mr. Young stated that ground vehicles can use many of the aircraft engine's war-developed qualities, such as light weight, high power, good economy, and reliability.

Commercial motor vehicle operators, seeking to transport the greatest payload over the most miles at the least cost, will find the low operating costs, higher power, and greater speed ranges of the aircraft engine very desirable, the speaker declared.

Mr. Young warned that experiments might lead to a high percentage of failures during the development period, and pointed out that such failures must be recognized as steps in progress toward lighter, more efficient designs in engines.

He recommended that engineers of ground vehicles learn to develop higher power at greater speed, to make use of the high heat conductivity of some metals, and to study effective cooling methods.

Science News Letter, August 19, 1944

DENTISTRY

Town Without Toothaches?

Theory that minute amounts of fluorine in drinking water will prevent tooth decay will be tested, as whole communities have become "guinea pigs."

By JANE STAFFORD

➤ THIS LITTLE town will have toothaches, this little town will have none. You might paraphrase the old nursery rhyme that way to describe the towns of Kingston and Newburgh, N. Y., which are engaging in a mass demonstration to test the theory that a minute amount of fluorine in drinking water is the way to banish tooth decay.

Kingston will be the town with toothaches. Newburgh will be the lucky one without, if the experiment goes the way everyone hopes it will.

Fluorine, chemical sister of the chlorine that many communities put into their drinking water to purify it, made headlines more than a decade ago because of its effect on teeth. In 1931, Dr. Margaret Cammack Smith and associates at the University of Arizona discovered that it was the fluorine in drinking water which caused the ugly mottled enamel condition of teeth.

The fluorine occurred naturally in the water supplies used by many towns in the southwest. Those who drank it in infancy and childhood, while their teeth were still in the formative stages, grew up with chalky, brown-spotted and pitted teeth. In some towns, every child had mottled enamel. When further studies confirmed the discovery of the relation between fluorine and mottled enamel, the town fathers of some of the communities took action to change the water supplies.

Discovered Earlier

Before this discovery, however, Dr. G. V. Black and Dr. F. S. McKay in the first thorough study of mottled enamel, made at Colorado Springs, reported that the teeth of the Colorado children they examined compared favorably, in regard to tooth decay, with those of other children where mottled enamel was unknown.

Other scientists investigating mottled enamel both in the United States and in Japan, England and South America, also began reporting the strange fact that children with mottled enamel did not have as much caries, or decay, as children without the mottled enamel condition.

The U. S. Public Health Service in 1933 began to study the distribution of mottled enamel and the amount of fluorine in the drinking water that would cause it. As the concentration of fluorine in the drinking water increased above one part per million, the Public Health Service scientists found, more and more of the children who drank it continuously from birth had mottled enamel. When the fluorine concentration was one part per million, or less, no mottled enamel resulted.

Dr. H. Trendley Dean and associates of the Public Health Service, who had been making these studies, next investigated the relation between fluorine and tooth decay. The studies were made in about 25 cities, some of which had fluorine in their drinking water and some of which had no fluorine. Marked differences were found.

Difference Seen

These differences are illustrated by comparing observations on 633 children in Aurora, Ill., a city whose water contains about one part per million of fluorine, with those on 1,008 children in the nearby communities of Evanston, Oak Park and Waukegan which use the fluorine-free water of Lake Michigan. Six times as many children in Aurora showed no sign of tooth decay. There was only one-third the total amount of tooth decay, only one-fourth the loss of six-year molars, and, most surprisingly, only one-seventeenth the amount of decay in the proximal surfaces of the upper front teeth.

That variations in diet or in amount of sunshine could have caused the difference was ruled out. Maywood and Oak Park, for example, are two Chicago suburbs within a mile of each other. Maywood uses a well supply containing a little over one part per million of fluorine. Oak Park buys fluorine-free Lake Michigan water from Chicago. Yet Oak Park has about three times the amount of dental decay as its neighbor, Maywood.

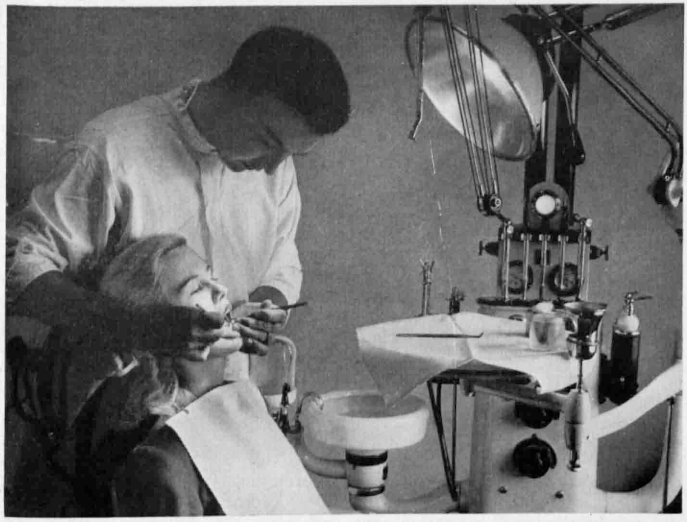
In order to equalize possible differences in diet, every 12, 13 and 14-year-old white child of continuous residence in every 7th, 8th and 9th grade in each public school in each city was examined. The populations of these cities was similar and it seemed unlikely there could be marked differences in diet among whole populations of cities in close proximity to each other.

Most Common Defect

Another point in favor of the fluorine theory and against the theory that tooth decay can be prevented by diet is the fact that after a generation of effort to improve teeth by diet and conventional prophylactic treatments, numerous independent surveys of school children give no indication of a decrease in the amount of dental decay. It remains the "most prevalent of all diseases," the most common of all defects of the human body.

As more and more evidence began piling up to show that a small amount of fluorine in the drinking water protected teeth from decay, people everywhere began asking why something could not be done about it. The New York State Department of Health decided something should and would be

TOOTH DECAY — The right amount of fluorine for growing boys and girls may be a way of preventing such bad tooth decay. American Dental Association photograph.



FEWER CAVITIES—When the dentist examines a patient's teeth in the future, he may find less decay because since infancy she has been drinking water to which a minute amount of fluorine had been added. Photograph by Fremont Davis, Science Service Staff Photographer.

done. So, under the direction of one of its dental experts, Dr. David B. Ast, it is staging a long-range demonstration which may prove conclusively the practicability of mass protection against tooth decay by the simple measure of adding a little fluorine to public drinking water supplies.

On the Hudson River, near West Point, is Newburgh, a town of some 30,000 population, which already has some 0.12 parts per million of fluorine in its water supply naturally and a well-equipped water filtration plant with a highly qualified operator in charge. To the three million gallons of filtered water the city uses daily will be added about 45 pounds of fluoride salt. This will bring one part per million of fluorine in the water as it flows from every tap and faucet in Newburgh.

Newburgh's five to 12-year-old children for the next 10 years will have their teeth examined every year in the schools by the associate research dentist of the state health department. Since fluorine acts on the tooth structure during the years of tooth development, it will be about 10 years before the full benefit of the water treatment will be realized.

So Newburgh's children will be the guinea pigs for this huge scientific experiment—lucky guinea pigs if it turns out as well as expected, for they will be spared the toothaches and more serious results of dental caries.

Every proper scientific experiment of this sort, whether on human or laboratory guinea pigs, must have its control or check run. A group as much alike as possible is selected. One-half gets the new treatment, the other does not. Every other condition is kept as nearly identical as possible. In that way, with the treatment the only variable factor, scientists can feel sure that if any difference appears in the treated group, it was due to the treatment and not to other variable factors.

For the control group in this mass experiment to test whether tooth decay can be banished by adding fluorine to drinking water, the children of Kingston were selected.

Science News Letter, August 19, 1944

ENGINEERING-MATHEMATICS

World's Greatest Machine For Automatic Calculation

See Front Cover

➤ THE ROBOT automatic sequence calculator shown on the front cover of this SCIENCE NEWS LETTER is the one recently presented to Harvard University by the International Business Machines Corporation (*See SNL,* Aug. 12). In the foreground are shown the "brains" of the great machine, the automatic sequence devices that give the calculator its name. Into these gadgets are fed a pre-punched tape that might remind you of an old-fashioned player-piano roll. But instead of playing a popular tune, these tapes instruct the machine what numbers to take, where to take them, and what to do with them when they get there—add, square, or multiply by other numbers. Where the machine still must rely on the help of a human mathematician is in planning the punching for the tapes.

The giant machine is the work of Commander Howard H. Aiken, associate professor of applied mathematics at Harvard, now on leave, who is responsible for the theory behind the machine's development, and, at the IBM Laboratory at Endicott, N. Y., Clair D. Lake, who was in charge of the invention of the machine, Frank E. Hamilton, Benjamin M. Durfee and James W. Bryce, all co-inventors with Commander Aiken.

The great machine, now being devoted to war work, will make possible after the war the exploration of new fields of mathematics, astronomy and other sciences now neglected because of the tremendous labor and time necessary for essential calculations.

Science News Letter, August 19, 1944

Nitrogen fertilizer applied to apple trees in *foilage sprays* is supplementing time-honored methods of soil application of the urea fertilizer.

Do You Know?

Pup seals weigh about 12 pounds at birth.

Adding *pectin* to fruit jams produces a product that can be packaged in paper.

Mexico is furnishing the United States with probably 60,000 *farmhands* to assist in the food production program.

Australian rabbits, long a destructive pest, are now heavy contributors to the country's food supply.

American milk and beef cattle are products of the development of wild cattle of Europe and Asia; bison are the only American *wild cattle.*

Over 41,000,000 pounds a month was the average primary *magnesium production* in the United States for the first three months of this year.

The sweet potato *weevil* that makes quantities of potatoes unfit for food each year, can live and multiply only on sweet potato and morning glory vines.

Shoes with *soles* impregnated with oils or wax to increase their wearing properties may in the future bear a special stamp.

Steep Rock lake in northeastern Ontario, with an area of four square miles, is being pumped dry to expose submerged deposits of high-grade iron ore now needed in the war effort.

The textiles of *ancient Peru* include every type of weaving known to the modern world and some types not known today; the finest ancient Peruvian fabrics have 270 threads to the inch.

Nearly 238,000,000 pounds of *liquid eggs* were produced in egg-breaking and drying plants in the United States during May; about one-half this amount was dried, 45% frozen, and the rest shipped for immediate consumption.

Searchlight *reflectors* on naval vessels are made of a cobalt-chromium-tungsten alloy, or of a nickel-base alloy for the smaller lights; the reflectors must resist the action of salt spray, air, powder and sulfur fumes, and be nonshattering during gunfire.

RADIO

Communications Meeting

May be first step toward the formation of a new international telecommunications union. Final proposals will be submitted after the war.

➤ LEADING ALL nations in an effort to bring order to the confused system of allocation of radio frequencies, the United States, through the State Department's Special Committee on Communications, held meetings under the direction of Dr. J. Howard Dellinger, of the National Bureau of Standards, on Aug. 11 and 12 at which the first steps were taken towards drawing up proposals for the postwar organization of the radio channels. The final proposals, representing the combined thinking of both industry and government, will be submitted by the United States for the consideration of all nations at a big postwar International Telecommunications Conference soon after the war is over.

Out of this important postwar conference may come a streamlined International Telecommunications Union that will form an integral part of a planned future world political organization.

"New treaties and new regulations governing communications will be necessary immediately after the war if we are to make room in the radio spectrum for the many wartime technical advances in radio, television, FM, and aviation, which brought with them new radio services such as radar," states Francis Colt de Wolf, chief of the Telecommunications Division, Department of State.

The purpose of this meeting was to discuss with representatives of industry some of the purely technical problems involved in allocating radio frequencies in preparation for the big conference immediately after the war. Six committees were organized at the meeting to study specific problems, and the combined reports of these committees will form the basis for the U. S. Government's recommendations for the modification of the International Telecommunications Convention in Madrid in 1932, and the Cairo General Radio Conference of 1938.

"The radio spectrum will be allocated by services, rather than by countries. The same part of the radio spectrum will be used in all nations for the same type of service. All aviation communication will be done within certain specified frequency ranges, maritime communications will use other ranges, amateur or "ham" broadcasting will be assigned still other ranges, and so on through all the services," Mr. de Wolf remarked.

The amount of spectrum space turned over to any one service will depend upon the importance and extent of the service. If, for example, it should be decided that one airline communications organization (owned and operated by other airlines in the country) should represent this nation in postwar air commerce, much less spectrum space would be required to fulfill its needs than if many airlines were to operate their own transmitters on a competitive basis, he pointed out. The location in the spectrum, high or low frequency, will depend upon the characteristics and needs of each service. For example, the

SICILIAN COAST—Ensign Robert Zeidman and the map he made of the Sicilian coast were vital to the successful invasion of the island fortress. These rubber contour maps are devised with infinite care, a slight deviation might cost many lives, even doom the operation. Official U. S. Navy photograph.

CITY OF GELA—Rubber topographical maps like this one of a city on the Sicilian coast, made things easier for landing troops. Made of rubber, the map shown in this official U. S. Navy photograph, can be folded or rolled up and is painted to look like the actual landscape. (See SNL, July 29)

frequencies between 4000 kilocycles and 25,000 kilocycles are particularly useful for long distance communication.

"Consideration will also be given to revamping the Bern Bureau, the organization in Switzerland that now acts as an international registering agency to which governments go to register certain sections of the radio spectrum for use of particular services within their borders. A board, as part of an International Telecommunications Union, may be set up to pass upon applications by nations for radio frequencies to make certain that they conform to agreed-upon international regulations, and to handle the many diverse details that require attention continuously between conferences," Mr. de Wolf stated.

"Each country must retain the sovereign right to regulate its own communications, nevertheless agreements between nations are absolutely necessary in order to permit standardization and increase the effectiveness of telecommunications. This would mean that radio stations in South America would not be allowed to disrupt communications between San Francisco and Chicago, as is quite possible now. Also with the frequency range for FM radio and other services the same all over the world, an FM receiver that works in the United States would work anywhere else," Mr. de Wolf pointed out.

Science News Letter, August 19, 1944

BOTANY

Cork-Oak Cuttings Rooted

➤ CUTTINGS FROM cork-oak trees have been induced to strike root, in successful experiments conducted at the Fruitland Nurseries in Augusta Georgia, under the direction of James G. Bailie. This development is expected greatly to speed up the establishment of American sources of cork, need for which was very acutely felt before the liberation of North Africa and the lessening of the U-boat menace removed some of the war-forced restriction on cork imports from the Mediterranean area.

As a result of the cork shortage, a drive for planting cork-oak trees in the climatically favorable parts of this country was pushed by Charles E. McManus, president of the Crown Cork and Seal Company in Baltimore. Science Clubs of America have been especially active in getting plantings made.

Since new supplies of cork-oak seedlings depended entirely on the domestic acorn supply, and there were never enough acorns to meet the demand, here was a crucial tight spot in cork-oak propagation. Now that it has been demonstrated that new trees can be started from suitable twigs, there should be no limit on the number available.

A further and very important advantage in the use of rooted cuttings is the possibility of better control over the kind of trees produced. Seedlings are always an uncertainty because of their inevitably mixed pedigree, and some out of every lot are bound to be poor. Rooted cuttings, on the other hand, are certain to be like the tree from which they are taken, so that it is possible to establish whole groves of uniform, high-yielding quality.

Rooted cuttings thus far planted have been relatively few, for the work is still on an experimental basis. Present plans call for a greatly increased number during the coming autumn and winter, with larger-scale tests under a variety of soil and climatic conditions.

Science News Letter, August 19, 1944

ECOLOGY

NATURE RAMBLINGS

by Frank Thone

Promoting Pollenitis

➤ RAGWEEDS, as everybody knows by now, are responsible for something like nine-tenths of all cases of hay fever in this country. Both of the common species have greatly increased in abundance since pioneer days, and the increase has been very largely due to the way we have used, or rather abused, the land our forebears won from the wilderness.

Weeds, on the whole, do not thrive in the wilderness. Virgin forest and unplowed prairie are normally rather tightly closed communities, with close-knit roots holding the soil against erosion and at the same time effectually keeping out intruders. Only when some calamity strikes, like a forest fire or a landslide, do weeds find a temporary roothold, like germs getting into a wound to cause festering infection.

Man's advent into new territory always takes the form of a whole series of artificial calamities. He cuts down the trees and plows up the sod to plant corn and other crops that demand that the soil be constantly kept stirred—an open invitation to weed seeds. He brings in livestock to pasture on the grass, and by overgrazing the range wears the sod thin and again leaves open sores for weed seeds to invade. He builds up cities and connects them with railroads and highways, leaving untidy, neglected corners and strips of land to be occupied by weeds. He provokes floods, which leave muddy river bottoms open to these pushing aggressors. When he has cut a forest clean, or squeezed plowland too poor to yield further profit he abandons it to erosion—and to weeds.

The two common species of ragweed fit perfectly into all these pictures. Low ragweed is a common cornfield weed, it grows thick in overburdened pastures where the grass has been eaten and tramped thin, it survives and spreads on abandoned and eroding fields. Giant ragweed marches its armies around unkempt field borders, ranges along highways and railroad rights-of-way, takes possession of land slums in and around cities, sweeps over the mud flats left by receding floods.

Demands are made every year, by tormented hay-fever victims and their sympathetic kindred and friends, that the public authorities "do something" about the masses of pollen-producing ragweed. Gangs of scythemen do a little temporary good; but attacking ragweed patches after they are grown is only a palliative. The real way to get rid of ragweed is to create conditions which will preclude its getting started at all. And that means complete adoption of thorough-going soil-conservation practices.

Science News Letter, August 19, 1944

PHYSICS

Midsummer Sunlight Has A Six-fold Advantage

➤ MIDSUMMER sunlight has a six-fold advantage over midwinter sunlight in concentration of ultraviolet rays having effects on human health, as measured at the National Bureau of Standards by Dr. W. W. Coblentz and R. Stair. Measurements were made under all kinds of weather conditions over a period of three and one-half years, with an ultraviolet intensity meter in combination with automatic integrating and recording apparatus.

Dr. Coblentz has also developed suntanning tests that correlate these instrumental measurements with the physiological reaction of the untanned human skin, which are expected to be of interest to physicians.

Science News Letter, August 19, 1944

• First Glances at New Books •

➤ FACTS LEARNED from explosions in this war are told by Lieut. Col. Clark S. Robinson in EXPLOSIONS, THEIR ANATOMY AND DESTRUCTIVENESS. In language that the average reader can understand with little difficulty, the story of just what happens when various types of explosions occur is told. Excellent reading for the layman who handles explosives and wants to understand them better. Complete list of all major explosions in this century is given in the appendix, with pertinent data. (*McGraw*, $1.50).

Science News Letter, August 19, 1944

➤ A DICTIONARY of aeronautical terms in nine languages; English, Spanish, Portuguese, French, Italian, Russian, Chinese, German, and Japanese, covers languages important in the air world. Definitions include both technical and non-technical terms, arranged so that words can be found easily. Useful charts and tables make up an appendix. Compiled by John E. Lanz from innumerable sources, the book is titled AVIATION DICTIONARY IN NINE LANGUAGES. (*R. D. and Ione Perkins*, South Pasadena, Calif., $6.50.)

Science News Letter, August 19, 1944

➤ VALUABLE AID to officers and men who must use maps published by various foreign nations is contained in FOREIGN MAPS by Everett C. Olson and Agnes Whitmarsh, (*Harper*, $4). It includes the information required to study foreign maps, explanations of signs and symbols used, and glossaries of map terms in pertinent languages.

Science News Letter, August 19, 1944

➤ WAR BABIES of the packaging business such as wet-strength bags, V-board boxes, corrosion-resistant coatings for fighter planes and GI field ration concentrates deserves a place in reconversion plans, manufacturers are advised by editors of the 1944 PACKAGING CATALOG, (*Packaging Catalog Corporation*, $2.50). Seven hundred pages of test data, physical and chemical properties and engineering know-how, a Buyers' Index and an up-to-date list of government controls tell the manufacturer all he wants to know about serviceable substitutes.

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➤ ARMCHAIR PILOTS who dream of having their own family car of the air one day will find Gilbert Paust's HERE'S HOW TO FLY a simple, sugar-coated way of getting the basic ground training they'll need to get a license. It covers aerodynamics, navigation, meteorology, load factors, and aircraft engines, avoiding too technical language. Has sample CAA tests. (*Essential Books*, $2.50).

Science News Letter, August 19, 1944

• Just Off the Press •

AIRLINES WAR TRAINING INSTITUTE BOOKS —*Infantry Journal*. OF INSTRUMENTS AND THINGS—W. A. Straith and Robert N. Buck, 20 p., illus., paper, 25c. ATTITUDE —Jerome Lederer, 17 p., illus., paper, 25c. INSTRUCTOR'S MANUAL — Howard K. Morgan, 28 p., paper, 25c. REFUELING THE AIRPLANE—A. G. Thomas, 28 p., illus., paper, 25c. FLIGHT CREW TRAINING PROGRAM—26 p., paper, 25c. RADIO OPERATING—John W. Stone, 65 p., illus., paper, 60c. USE OF NUMBERS—Howard K. Morgan, 66 p., illus., paper, 60c. FLIGHT PRINCIPLES—Sherman E. Crites, 61 p., illus., paper, 60c. ELECTRICAL SHOP —John W. Stone, 16 p., illus., paper, 40c. CELESTIAL NAVIGATION—Elbert F. Blackburn, 122 p., illus., paper, $1.

ADVANCES IN ENZYMOLOGY and related Subjects of Biochemistry—F. F. Nord and C. H. Werkman—*Interscience*, 332 p., illus., $5.50.

ALLERGY IN PRACTICE—Samuel M. Feinberg and Oren C. Durham—*Year Bk. Pubs., Inc.*, 798 p., illus., $8.

ELECTRONICS: Today and Tomorrow—John Mills—*Van Nostrand*, 178 p., $2.25.

ESSENTIALS OF ARITHMETIC—Henry Sticker—*Essential Books*, 256 p., $1.50.

HERE'S HOW TO FLY — Gilbert Paust—*Essential Books*, 264 p., illus., $2.50.

A MONOGRAPHIC STUDY OF BEAN DISEASES AND METHODS FOR THEIR CONTROL—L. L. Harter and W. J. Zaumeyer—*Govt. Printing Office*, 160 p., illus., paper, 25c.

ORGANIZING TO HELP THE HANDICAPPED: A Brief Guide for Voluntary Associations for the Crippled—Arthur Train—*Nat. Soc. for Crippled Children*, 165 p., 50c.

POISONOUS SNAKES OF THE EASTERN UNITED STATES WITH FIRST A'D GUIDE —Harry T. Davis and C. S. Brimley—*N. C. State Museum*, 16 p., illus., paper, 10c.

SCIENCE IN SOVIET RUSSIA: Papers Presented at Congress of American-Soviet Friendship—*Cattell*, 97 p., $1.50.

A SOURCE BOOK OF BIOLOGICAL NAMES AND TERMS — Edmund C. Jaeger—*Thomas, C. C.*, 256 p., illus., $3.50.

SYMPOSIUM ON THE APPLICATIONS OF SYNTHETIC RUBBERS—*Am. Soc. for Testing Materials*, 134 p., illus., paper, $1.50.

FORESTRY

Forestry Medal Awarded Prof. Henry S. Graves

➤ THE SIR William Schlich forestry medal, one of the outstanding honors in its field, has been awarded to Prof. Henry S. Graves, emeritus dean of the Yale School of Forestry, in recognition of distinguished services in his profession.

The medal was founded in memory of the late Sir William Schlich, who established the forestry service in India and was professor of forestry at Oxford University. Americans as well as citizens of the British Commonwealth participated in raising the fund.

The award has previously been made to Americans only twice. In 1935 it was given to President Roosevelt, and in 1940 it went to Gifford Pinchot, pioneer in the conservation movement and first chief of the U. S. Forest Service.

Science News Letter, August 19, 1944

•New Machines and Gadgets•

⚙ *HOME-MADE U-shaped levelling gage helps keep a tractor operating on the level in contour plowing. Two glass tubes, mounted vertically on the tractor two feet apart on the line of travel, are connected with rubber tubing containing light motor oil. Marks on the glass show the oil heights when the tractor is level.*

Science News Letter, August 19, 1944

⚙ *SEWING THIMBLES, made of molded plastic material, temporarily are replacing the familiar metal finger caps. They have vertical instead of honeycombed indentations.*

Science News Letter, August 19, 1944

⚙ *TRANSPARENT plastic models of many assembled or functional parts of a huge United States bomber are used in the factory where the plane is made to train new workers. Blocks of acrylic plastics are machined to exact specifications for assembly either with other plastic or with metal parts.*

Science News Letter, August 19, 1944

⚙ *CYLINDERS of oxygen or carbon dioxide used for breathing or fighting fires in warplanes, are tightly wound with high-tensile steel wire so that a bullet passing through one leaves a clean hole and does not cause it to explode. The picture shows the wire being wound*

at high-speed on a lathe.

Science News Letter, August 19, 1944

⚙ *OVEN BROILER is a circular grill held over a drip pan at the end of a hinged arm permanently attached to the inside of the oven door. Grill and pan can be removed when the oven is needed for ordinary baking, the arm folding back against the door.*

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⚙ *DRESSING MASK for women is designed to protect clothing from becoming soiled by facial cosmetics while being donned or removed. The mask, shaped to fit the face and neck and held in place with an elastic band, is made of a net material with an impervious covering or shield inserted over the nose and lips.*

Science News Letter, August 19, 1944

⚙ *SLED RUNNERS attachable to the wheels of a baby carriage, quickly and easily convert it from a wheeled vehicle to a snow or ice sleigh. Hand clamps attach the runners under the rims of the wheels when desired, and to the axles when not in use.*

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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 221.*

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