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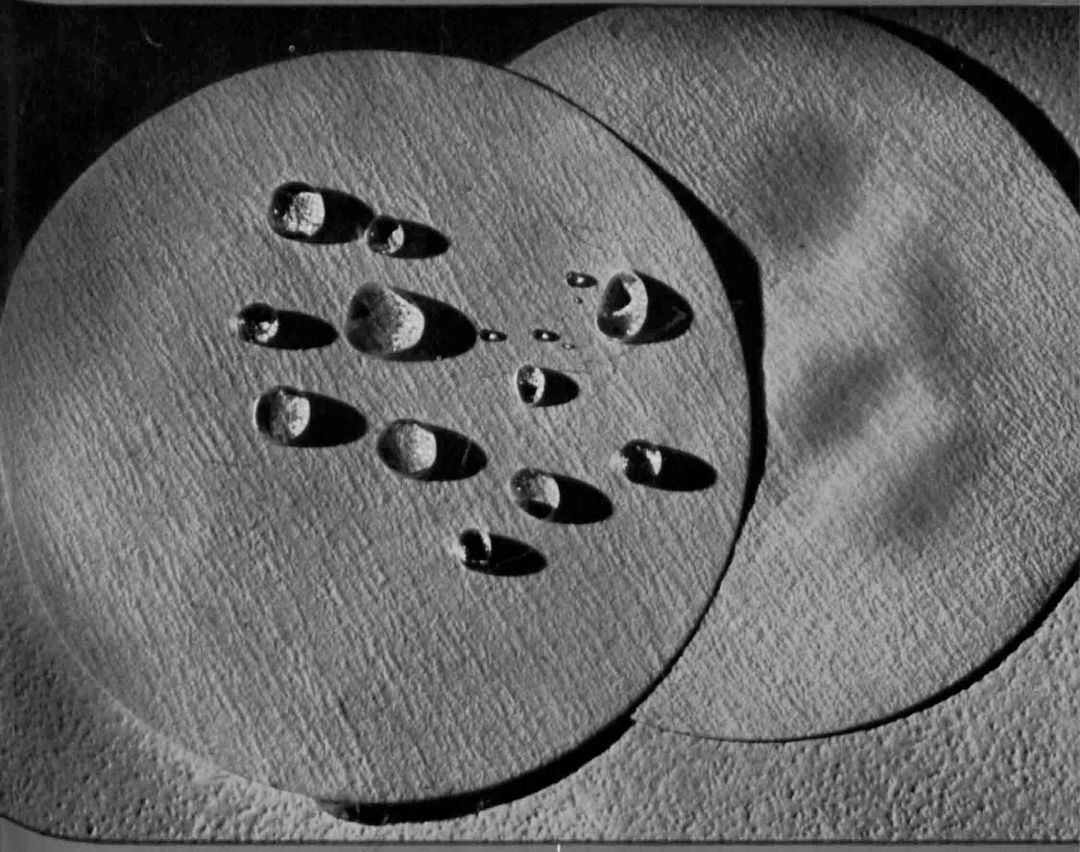
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • SEPTEMBER 16, 1944



Repels Water

See Page 186

A SCIENCE SERVICE PUBLICATION

What's the Rush?

It's the telephone rush. Every night thousands of service men and women dash to the nearest telephones to talk with families and friends at home. Most of the Long Distance calls from camps and naval stations are crowded into a few short hours.

Many circuits are likely to be crowded at that time and it helps a lot when you "give 7 to 10 to the service men."

BELL TELEPHONE SYSTEM

MEDICINE

Pills Help Airsickness

Among 200 cadets given hyoscine, only one was "obviously airsick." There was an incidence of 6.3% among those given dummy pills.

➤ AIRSICKNESS among a large group of cadets in training at the Naval Training Center, Pensacola, Fla., was almost completely banished by giving them pills containing hyoscine one-half to one hour before the take-off, Lt. Joseph L. Lilienthal, of the Naval School of Aviation Medicine at Pensacola, reported at the meeting of the Aero Medical Association in St. Louis.

Hyoscine has long been credited with ability to prevent and cure seasickness. Under its other name of scopolamine, it was familiar some years ago as one of the drugs used to induce twilight sleep anesthesia for childbirth.

The drug was given to the cadets in the form of the standard Navy issue of hyoscine tablets. Among 200 cadets getting these tablets, only one was "obviously airsick." The cadets did not know the ingredient of the tablets, and further to rule out any psychological effect, another 239 were given exactly similar looking tablets of milk sugar. Airsickness afflicted 15 of these cadets, an incidence of 6.3% compared to 0.5% among those getting the hyoscine pills. Among 531 who got no pills of any kind, there were 40 cases of airsickness, an incidence of 7.5%.

The cadets were in the final phases of their intermediate patrol bomber training and had about 200 hours of flight experience. They spent two-thirds of the flight in non-piloting duties where airsickness was more likely to develop.

Hyoscine was also given to a small group of experienced airmen, such as pilots undergoing refresher courses in aerial acrobatics and combat tactics. These men had had some airsickness during their original flight training but had become adjusted to flying. When they resumed violent stunting, the airsickness returned and seriously impaired their ability to perform the maneuvers required in the refresher courses.

Hyoscine pills completely protected them from the airsickness, and after taking the pills before three or four flights they became acclimated and had no more airsickness. This suggests, Lt. Lilienthal pointed out, that hyoscine might be used in hastening the normal process of acclimatization to flight.

The effects of the drug last for at least four hours and there are no undesirable side-effects from it. Whether the effect would last longer was not learned. Undesirable effects might result from repeated doses, Lt. Lilienthal warned.

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Human Centrifuge

➤ KEPT a military secret for two years, a human centrifuge and some of the studies made with it were reported by Dr. C. F. Code, Dr. E. H. Wood, Dr. E. H. Lambert and Dr. E. J. Baldes, of the Mayo Aero Medical Unit at Rochester, Minn.

Object of the human centrifuge studies was to learn more about the dangerous black-outs and red-outs that occur during swift ascents and descents. The pilot or person being studied sits in a gondola which is whirled around a central axis, something like the rides at an amusement park, only faster. The speed can be regulated to deliver to the pilot in the gondola the exact acceleration under study.

During positive acceleration there is a period of progressive failure, the scientists found. During this period the pulse rate increases, the blood pressure is lost from the ear, the pulse in the ear may be reduced or lost, blood pressure at the level of the brain falls, changes in vision if they occur become evident and the man is in his poorest physiologic state.

Then between eight and 12 seconds after acceleration at 1.5 g (g is acceleration due to gravity) a reaction time occurs and a period of compensation is ushered in. The blood pressure rises, the pulse at the ear may increase or return, the blood returns to the ear, the pulse rate increase ceases and the pulse may slow. If compensation is sufficiently complete, recovery from visual symptoms will occur and the pilot will see clearly again.

In most persons symptoms begin between the fourth and seventh seconds after the maximum pull of gravity is attained. They seldom start before three seconds, and rarely after 10 seconds. If unconsciousness does not occur, recovery from visual symptoms often takes place during the latter part of a 15-second run.

Test pilots often take advantage of the symptom-free period at the start of the run when required to test aircraft at high accelerations. The pilot will limit the time of his exposure to one to three seconds and thus accomplish the tests at six, seven or eight g without symptoms.

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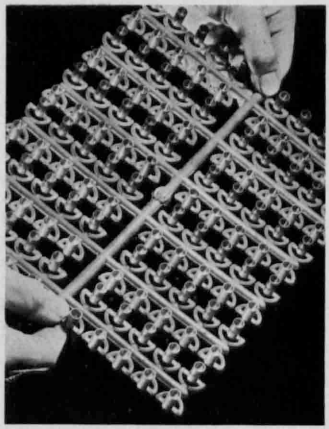

***SCHOOL DAYS**—This attractive pattern is really a mold for tenite pencil ferrules. With plastic ferrules, color possibilities for scholar's taste are unlimited.*

Sweets Help Airmen

➤ AIRMEN in the future will eat sweets before and during high altitude flights and will refrain from excessive smoking, particularly before flights, if practical application is made of studies reported by Dr. R. A. McFarland, Dr. M. H. Halperin and Dr. J. I. Niven, of Harvard University, at the meeting.

Tests showing for the first time that very small amounts of carbon monoxide are harmful to the airman and other tests showing his ceiling can be raised a mile by taking about an ounce and three-fourths of sugar just before the flight were reported.

The carbon monoxide which may come from engine exhaust gas, tobacco smoke or gunfire is harmful because it reduces the oxygen-carrying ability of the blood, thus increasing the ever-present danger at high altitudes that the brain may not get enough oxygen for proper functioning. Even as little carbon monoxide as would be absorbed from three cigarettes was equal, the tests showed,

to an altitude of 8,000 feet in its effect on visual sensitivity.

Ability to recognize differences in light intensity was used as a test of the effects on the brain and central nervous system of lack of oxygen.

The sugar, which is almost the only thing the brain can use for fuel, can raise the airman's ceiling by counteracting lack of oxygen. If either fuel or oxygen to burn it is lacking, the scientists explained, the oxidative processes necessary to keep the brain nourished for normal functioning are slowed. At high altitudes the oxygen supply is low but this can be made up for, the tests showed, by supplying more sugar for fuel.

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Pressure Breathing

➤ PRESSURE breathing fights the lack of oxygen at altitudes of 40,000 feet and over, Lt. Col. A. P. Gagge, of the Aero Medical Laboratory at Wright Field, Ohio, told the meeting.

In ordinary breathing, he explained, effort comes with drawing in a breath, not with exhaling. Pressure breathing reverses this to definite effort on exhalation. The advantage is an increase in partial pressure of oxygen in the lungs with consequent rise in the oxygen saturation of the blood in the arteries.

At 45,000 feet a pilot breathing oxygen through his mask at a pressure of 20 millimeters of mercury will have his blood saturated with oxygen to about the same extent as if he were breathing air at 14,000 feet.

A normal person, Col. Gagge reported, can maintain useful consciousness and carry out normal duties for a half hour or more at 45,000 feet if pressure breathing is used. He showed an oxygen mask designed to enable pilots to pressure breathe.

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Commercial Aviation Aided

➤ THE FIRST report of a military development being applied to commercial aviation was presented by Dr. L. G. Lederer, medical director of Pennsylvania Central Airlines.

Red-lighted instrument panels have now been installed in cockpits of this airline's planes so that the pilot's ability to see in the dark will not be interfered with. PCA pilots are also provided with the full-view red-adapted goggles developed by the Navy for use after landing and taxiing to the airport and just before the take-off on the runway starting line. The goggles are needed until airports correct their lighting so that the pilot's dark adaptation will not be destroyed by the glare of spotlights now used during loading and unloading for turn-around procedures.

This airline also plans to give its pilots a diet high in starches and sweets when they are on night operations with the weather piling up, or for flights lasting six hours or more. This will be an application of another war-induced advance, the finding that high carbohydrate diets raise the ceiling of men under conditions of oxygen lack.

Low-pressure chamber indoctrination of pilots, mental pre-selection tests, and air evacuation of casualties in floods and other civilian disasters, are further applications from military aviation that Dr. Lederer believes will be applied to post-war commercial aviation.

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PUBLIC HEALTH

Hunting Season Brings Rabbit Fever Danger

➤ THE RECENT release of ammunition for hunting makes timely a warning about the dangers of tularemia, or rabbit fever as it is also called. Muskrats, opossums, woodchucks, beaver, pheasants and other game birds may also have rabbit fever, though the chief danger to humans is from infected rabbits.

This sickness starts with a sore at the place where the germs enter the body. These sores are frequently quite extensive, much swollen, discolored and ulcerated. Nearby lymph glands enlarge and may form pus. The patient has fever and may feel very weak and exhausted. About one out of 20 patients die of the disease.

Unlike many other germs, the germs of rabbit fever can go through healthy skin without having to have a cut or scratch or bite to get through. Best way to avoid the disease, therefore, is to avoid handling wild rabbits or the carcasses or skins with the bare hands.

Health and medical authorities used to advise all who handle rabbits, whether hunter, trapper, market man, or cook, to wear rubber gloves for protection against the germs. That is no longer practical because of the rubber shortage. So the best advice is to handle the uncooked carcasses as little as possible with the bare hands. Don't handle them at all if you have any cuts, scratches or sores on your hands. Wash hands thoroughly with soap and water after handling.

Not all rabbits, of course, are infected with tularemia. Most human cases of rabbit fever are reported from the Central States which indicate that more infected rabbits are likely to be found there. Hunters and trappers should be suspicious of sick animals that are easily shot or caught. Peculiar whitish spots on liver and spleen are suspicious signs.

Thorough cooking kills the germs, but they remain alive and virulent in the red juices of undercooked game.

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SCIENCE NEWS LETTER

Vol. 46 SEPTEMBER 16, 1944 *No. 12*

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 post-office at Washington, D. C., under the Act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trade-mark, 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.

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EDUCATION

Regional Study

Education may be revolutionized after the war, with the emphasis on area study. Textbooks would have to be a sort of encyclopedia of contemporary world.

➤ CIVILIAN education after the war may be revolutionized by a by-product of Army training—the emphasis on regional, or area, study, Dr. George B. de Huszar, of the University of Chicago, told members of the Fifth Conference on Science, Philosophy and Religion, meeting in New York. Global study on a regional basis may well be an essential part of all liberal education with more intensive training along the same lines for those concerned with international politics.

The "textbook" for such area study would have to be a sort of Encyclopedia of the Contemporary World which would not be geography or economics or politics, but an integration of the facts collected in these and many other fields of science and social research, Dr. de Huszar indicated.

Such a work would be on a higher level and be more illuminating, he said, than the various "outlines" and "inside stories." It would include the physical characteristics, climate, resources, transportation system, economic structure, linguistic pattern, racial situation, political structure, social and religious pattern and intellectual and artistic life of the region.

The cooperation of many specialists would be essential for gathering this material and keeping it up to date, because no one person can discuss with authority the different phases of a region.

"Liberal education," Dr. de Huszar declared, "aims at developing intelligent and responsible citizens. A primary prerequisite of this in the modern world, is the ability to think in global terms."

In addition to its part in liberal education, Dr. de Huszar recommended an intensive type of regional study as preparation for international administration.

"There is a growing realization," he said, "that diplomats, who up till now dominated international affairs, are not able to deal with the complex social and economic problems of the world. The role of the expert is becoming more and more important.

"After all, international politics is not merely a question of protocols and other legal matters. To face effectively the vast problems of the postwar world, more will be needed than knowledge of Grotius or Homer. The need for qualified personnel to deal with the social, economic, medical and administrative problems of various regions will be very great.

"To train such personnel is one of the most important tasks of postwar planning."

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Education Seen as Cure

➤ EDUCATION is seen as a cure for the present ills of the world, by Dr. William Seifriz, of the University of Pennsylvania, who addressed the Conference.

The idea is old, he admitted, and slow, and without popular emotional appeal.

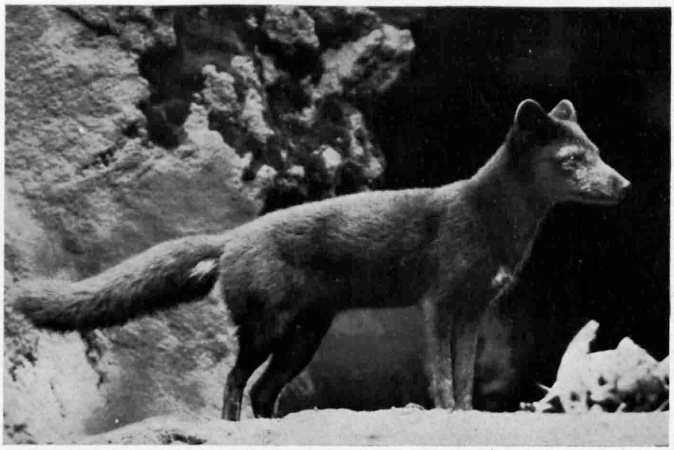
"But its most disturbing feature," he added, "is the fact that the education is to be of ourselves and not of others."

"The failure to recognize that this war is a world illness and not due solely to German belligerency is the background for some well-meaning but futile suggestions as to a cure," he said. "This fallacious reasoning is the basis of the suggestion that we breed the war strain out of the Germans, just, I presume, as easily as a geneticist breeds color out of or into corn. It would be a simple matter to breed blonde hair and blue eyes out of the Germans. If war is, as the geneticist would say, linked with blue eyes, then something might be done. Otherwise, we are talking nonsense."

A new kind of university in which the American principle of self-government would be applied and in which the practical problems of life would be studied, is advocated by Dr. Seifriz. The scholar must not remain aloof from world affairs, he indicated.

"The scholar's plea that he has led too isolated and protected a life to understand the world at large," Dr. Seifriz declared, "is but a blind for his unwillingness to understand, his unwillingness even to attempt to understand. As for the inability of the masses to comprehend his work, that is more nonsense.

"The scholar likes to imagine that he stands head and shoulders above the masses. It was a repair shop mechanic who built and flew the first airplane. The mathematics of aerodynamics was undoubtedly difficult for him, but he grasped enough of it to put it to work when some very eminent scientists had



THRIVES IN ARCTIC—Blue foxes make ideal inhabitants for islands in the Bering Sea. Lack of natural enemies makes the Pribilof Islands ideal for fox raising. Plans to improve the breed by sparing a number of the finer specimens while collecting pelts have been formulated by the Fish and Wildlife Service of the U. S. Department of the Interior.

said it would not work."

The new university envisioned by Dr. Seifriz would be governed by the scholars themselves functioning as a cooperative guild. Research would begin in the freshman year. Lectures and textbooks would serve as background, the emphasis being on discussions and individual thinking. Intellectual contact between student and teacher would be developed to the highest possible degree.

Through such a new university, Dr. Seifriz believes, if made a thing of beauty and joy, of courage and understanding, may be established a new order, a new culture on earth.

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Science Will Aid Peace

➤ SCIENCE will contribute to the establishing of a real peace after the war and the wiping out of class, racial and national hatreds even though many scientific discoveries and judgments have nothing specifically to do with such tensions. This is the forecast of Dr. H. A. Overstreet, of the College of the City of New York, expressed at the conference.

"Science," he said, "provides an atmosphere in which poisonous social growth tends to perish."

But there are, he pointed out, specific scientific discoveries about human relations which will help in establishing a peaceful world by "discrediting old folk tales about groups and peoples; old prejudices about color and race; old superstitions about ethnic and national superiority."

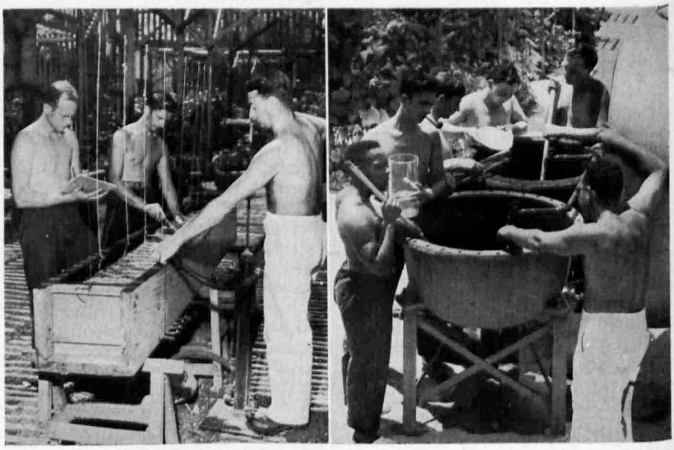
Some of these discoveries, as listed by Dr. Overstreet, are:

That there are greater differences between individuals within any racial or culture group than there are between the groups.

That group prejudices—antagonisms toward other groups—are not something born in people but are created by the peculiar man-made conditions of their own culture.

That individuals are changed by their environment, and can be changed again when the environment changes.

That there is an irreducible minimum (worked out by empirical research) of psychological needs which number at least six: (1) work, of the kind that is individually satisfying and socially approved; (2) decent living conditions; (3) adequate education; (4) the respect of one's fellows; (5) equality before the law; and (6) participation in the government of one's life.



GARDENING FOR HEALTH—The convalescent soldiers seen in this War Department photograph, are cleaning and sterilizing semi-portable sub-irrigation gravel beds in preparation for planting soilless gardens (left). Students and instructors mix individual chemical compounds in black iron vats, (right). This method of compounding teaches the students the chemical characteristics of each essential element used, and is therefore far more instructive than the use of ready-made mixtures of fertilizer chemicals.

That lack of any of these essentials is bad not only for the individual who lacks them but for all those around him, including those responsible for his deprivation.

That the individuality of individuals is important and should be considered.

And finally, as clearly demonstrated by psychological and psychiatric research, that excessive anger and hate brings with it both mental and physical illness.

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HORTICULTURE

Convalescent Gardening

➤ SOILLESS gardening, with plants growing in gravel-filled concrete tanks through which fertilizer-carrying water is pumped twice a day, is giving convalescent men at the AAF Regional Hospital in Coral Gables, Florida, healthful outdoor occupation, training them in a skill which may prove profitable after the war, and at the same time producing quantities of choice vegetables to supplement regular hospital rations.

The project was put into operation by the hospital's commanding officer, Col. Dan Ogle, with Dr. Alice Writhrow and Dr. R. B. Writhrow of Purdue University as civilian consultants. Sixty of the 200 ambulant cases have taken up the work.

Among the prize vegetables are tomatoes that were grown without benefit of bees as well as without benefit of soil. Instead of being pollinated, their flowers were sprayed with dilute solutions of growth-promoting substances. This stimulated the setting of fruit, but since there had been no pollination there were no seeds. The tomatoes are said to have a fine flavor.

Similar projects will be set up at other AAF Convalescent Centers by the Convalescent Training Division of the Air Surgeon's Office.

Similar gardens are being undertaken for the benefit of flyers still in the field, especially on remote islands so rocky that little or no soil can be found for planting ordinary gardens. Three such islands are scheduled for soilless gardens: Canton island in the central Pacific, Espiritu Santo in the south Pacific and Ascension island in the Atlantic. Similar installations will also be set up at Port Moresby in New Guinea and Karachi in India.

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MEDICINE

Kenny Treatment Results

Survey of 40 polio patients shows that those treated in the early, acute stage seldom develop deformities and many recover the use of arms and legs.

➤ WHEN infantile paralysis patients are given the Kenny treatment starting in the early, acute stage of the disease, very few of them develop deformities and very many recover the use of arms, legs and other paralyzed muscles, it appears from a report by Dr. Miland E. Knapp, of the University of Minneapolis School of Medicine, at the American Congress of Physical Therapy in Cleveland.

The amount of permanent nerve damage, or motor denervation as it is technically termed, is probably not changed by the treatment, Dr. Knapp stated.

His report was based on 40 patients treated in 1941 and 1942, of whom 32 were examined personally by Dr. Knapp one and one-half and two and one-half years after the treatment was given. He had originally intended to compare the results of treatment of these patients with a similar group treated by orthodox methods, but this was found to be impossible because some modification of the Kenny treatment was being used in every nearby institution and in none was an orthodox method used.

The controversial theories proposed by Miss Kenny were only briefly discussed by Dr. Knapp. Her theory of "mental alienation" as a psychologic result of painful muscle spasm appears not to be correct, he said, because the incidence and location of the spasm or muscle shortening does not in any way correlate with the incidence and location of muscle weakness. This, he pointed out, indicates that the generally accepted theory of "muscle imbalance" is also incorrect.

A certain number of infantile paralysis patients will have permanent motor denervation and this is probably not affected in any way by the type of treatment given.

"However," Dr. Knapp said, "by taking into account the fact that muscle shortening is present and treating it early and vigorously and at the same time training the muscles to carry out rhythmic, coordinated movement, the functional efficiency of the patient may be increased to a point where his activity may approach normal, even though many of his muscles are still weak.

"Thus the patient makes the maximal use of the muscle power he has left. Until effective methods of prevention are developed," Dr. Knapp declared, "this must necessarily be the object of our treatment."

Treatment should not stop, he added, when the patient has reached "normal" flexibility. The person with weak muscles may need abnormal flexibility.

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***DOUBLE HARVEST**—This bumper crop of cucumbers and egg-plants is really only a by-product of the harvest of health for the convalescents.*

NUTRITION

Weeds May Become Valuable Vitamin Source

➤ VITAMINS from the wayside may prove excellent substitutes when other sources of important vitamins are lacking, advises the U. S. Department of Agriculture. A number of wild fruits have been found exceptionally high in important vitamins.

Buffaloberry, a native shrub widely recommended for erosion control, is far richer in ascorbic acid (vitamin C) than the citrus fruits, which are among the best fruit sources of this vitamin at present in use. Ripe buffaloberries, as tested at the North Dakota Experiment Station, furnish so much ascorbic acid that a generous serving supplies about twice the standard daily allowance of the vitamin recommended by the National Research Council. Jam made from these ripe berries contains so much of this vitamin that even a little spread on a slice of bread adds worthwhile amounts of ascorbic acid to the day's supply.

Wild blueberries, eaten raw, contain a little less ascorbic acid than canned tomato juice; while papayas and mangoes also supply this vitamin.

Wild plants are good sources of the vitamins of the B complex. In Arizona two varieties of pecans were found to be high in thiamin but poor in riboflavin. The Minnesota experiment station discovered wild rice to be a good source of several of the B vitamins—thiamin, riboflavin, nicotinic acid, and pantothenic acid. According to the Massachusetts station, ordinary field mushrooms are also rich in these four B vitamins.

Additional tests of other wild plants may make available a great storehouse of roadside vitamins to fall back on in case the usual supply proves inadequate.

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NUTRITION

Possible Clue to Role Played by Biotin

➤ A POSSIBLE clue to the role in human nutrition played by biotin, little understood but much publicized member of the vitamin B group, appeared in studies reported by Dr. William H. Summerson, Dr. Johanna M. Lee and Dr. Chester W. H. Partridge, of Cornell University Medical College, at the meeting of the American Chemical Society in New York.

Biotin, it appears from their studies, may play a part in utilization of starches and sugars. Tests with liver slices kept alive outside the body point to such a role, although the studies have not yet gone far enough to show the actual function of biotin.

If through further studies the scientists discover an enzyme system in which biotin is involved, this chemical will take its place with three other members of the vitamin B group, thiamin, riboflavin and niacin, which scientists have found are involved in enzyme systems and which they know have something to do with starch and sugar utilization.

Of all the many members of the vitamin B group, only thiamin, riboflavin and niacin are known to function in the human body, although scientists assume the others do, too, from the fact that they are found in every cell in the body. If biotin joins this small group of B vitamins known to have significance for human nutrition, it will also, presumably, join the group of vitamins to be reckoned with in planning the day's diet.

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MEDICINE

Tonsillitis Recovery Speeded by Sulfa Drug

➤ PATIENTS with tonsillitis will recover at least one day sooner than they otherwise would if they are given sulfa drugs in small doses, it appears from a report by Capt. Edward D. Freis, of the Army Medical Corps, *(Journal, American Medical Association,* Sept. 9.)

Considering the numbers afflicted with tonsillitis every winter, the saving of even one day in hospitalization has much economic and military importance, amounting to thousands of man-days salvaged, Capt. Freis pointed out.

His report was based on studies of 405 young men of military age who had tonsillitis. One group of 100 had their throats sprayed with salt solution. Another 100 had sulfanilamide powder sprayed on their throats every two hours in addition to the salt solution spray every four hours. A third group of 115 got salt solution spray and sulfadiazine pills four times a day. The remaining 90 had their throats sprayed with microform crystals of sulfadiazine.

The last group recovered fastest, but the difference between their recovery times and those of the other sulfa-treated groups was not great. Because it is easier to give the drug in pills than by spray, Capt. Freis calls this the "ideal" treatment procedure. No toxic or sensitization reactions occurred in any of the sulfa-treated patients.

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MILITARY SCIENCE

Super-Bombsight Used To Train Bombing Crews

➤ A NEW KING-SIZE bombsight that never leaves the ground is used to train Army Air Force Cadets for raids on Axis lands. Five feet high, eight feet long and five feet wide, the super-bombsight compares to the actual AAF bombsight as a washtub compares to a wristwatch.

The AAF bombsight, a mechanical brain that is not much larger than a typewriter, determines accurately the correct point in space at which a specific type of bomb must be released to strike a selected target.

When training command instructors at the Bombardier School, Midland, Tex., discovered that the regular bombsight was too small to be used effectively for classroom instruction, they originated the new super-sight.

Bombardier cadets must be thoroughly familiar with the inner workings of their precision aiming device. Some of the more important parts are almost microscopic in size. The big bombsight enables cadets to see more clearly just how the wheels go round on the inside when they draw a bead on an enemy target.

The mammoth instrument is an actual working bombsight, and could be used in the air to drop bombs with deadly accuracy, if a plane could be built with a large enough nose to house it.

The training bombsight may be broken down into five separate units, so that the instructor can explain the mechanical operation of each unit. The units, in turn may be broken down further into nearly 25 smaller parts. Instructors estimate that the king-size bombsight enables them to teach students bombsight principles in less than half of the time formerly required.

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IN SCIEN

MEDICINE

Sponges of Frozen Starch Suggested for Surgical Use

➤ THE USE of sponges of frozen cornstarch for internal surgical dressings that can be left in the body when the surgeon sews up the operative wound is suggested by Claude W. Bice, M. M. MacMasters and G. E. Hilbert, of the U. S. Department of Agriculture Northern Regional Research Laboratory (*Science,* Sept. 8).

The starch sponges could also be used to introduce medicinals such as penicillin and sulfa drugs into the body during operations, they suggest.

The sponges would be slowly dissolved and absorbed in the body and the medicinal substance at the same time would be slowly released, the scientists believe, on the basis of tests of the studies in beef serum.

The sponges are highly absorbent and, unlike cotton, they are firm enough to hold absorbed liquid during gentle handling.

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INVENTION

Learning to Read Made Easier By New Machine

➤ WITH schools in session again, heightened interest attaches to a new device to make learning to read an easier task for young children, on which U. S. patent 2,357,593 has just been issued to Dr. Ullin W. Leavell of the George Peabody College for Teachers, Nashville, Tenn.

One of the difficulties to be surmounted when a child first attempts to read is to get him to focus his attention on the word or phrase at which he is supposed to be looking, embedded as it is in a mass of other words of equal attention-claiming value. Dr. Leavell overcomes this by first projecting the whole text on a screen, at low illumination. Then brighter light is shot through the word calling for immediate attention, making it stand out.

In rapid succession this is done for each word down the whole line, so that the pupil's attention moves on in natural order, and training is given in a proper reading rhythm—something which many persons are never able to acquire under traditional teaching methods.

Science News Letter, September 16, 1944

CE FIELDS

ENGINEERING

Plumbing Protected Against Corrosion

➤ HOUSEHOLD water pipes and plumbing can be protected from corrosion and their life greatly increased by the addition of small amounts of relatively inexpensive sodium silicates to the water passing through them, declared Dr. William Stericker of the Philadelphia Quartz Company at the meeting of the American Chemical Society in New York.

The use of these chemicals in protecting piping has proved successful in pipes made of plain and galvanized steel, brass, aluminum, and some combinations, he stated. Their effectiveness is particularly marked in hot water. The hardness of the water is not increased nor is a definite calcium or magnesium content necessary.

Examples were given by Dr. Stericker to illustrate the advantages gained and the methods used for feeding the silicates in laundries, office buildings, apartment houses, residences and factories. Silica as it occurs in soluble silicates is the most effective form, he said. High concentrations help more rapid formation of the protective film. Once this thin tenuous layer is in existence, it can be maintained with more dilute solutions.

Science News Letter, September 16, 1944

MEDICINE

Mosquitoes Fought by Crop Dusting Methods

➤ LOW-FLYING A-20 Havoc bombers of the Army Air Forces combat malaria-carrying mosquitoes in the marsh lands and flooded areas of the Italian Peninsula and of Sardinia and Corsica with "dust bombs."

Using the same methods employed in crop-dusting in the United States in the home front war against agricultural insect enemies, these bombers roar across breeding grounds of malaria-carrying mosquitoes carrying dust insecticide. They fly at altitudes of 20 or 30 feet, and each plane drops about one and one-half tons of dust in 45 minutes.

Dusting powder is preferred by those in charge of the program where large swampy areas are to be covered. However, there are some planes equipped to carry oil sprays, but they are used only on closely confined areas such as canals. The oil-carrying planes have four 37-gallon tanks. The whole load is discharged in one minute.

Operations are conducted under the direction of men whose civilian experience has included dusting crops in the Cotton Belt of the United States, and a malarialogist.

Planes frequently fly in formation. When the malarialogist spots an objective, he radios the dusting expert who flies in another plane. The dusting expert instructs the other aircraft on the procedure to be followed: then, like a squadron of fighter planes, they swoop down and "dust-off" the enemy.

Science News Letter, September 16, 1944

CHEMISTRY

New Fire Extinguisher Works Like Mouse-Trap

➤ A SPRINKLER-type fire extinguisher that does not require the installation of an elaborate piping system is covered by patent 2,357,682, issued to Charles R. Morton of Summit, N. J.

Each unit consists of a can containing a fire-extinguishing fluid, which can be suspended from the ceiling at any convenient point. On the under side is a spring arrangement very similar to that of a common mouse-trap, held in the "set" position by a link of metal with a low melting-point. The spring carries a pointed plunger, with two rows of holes.

If a fire occurs, the link melts, the released spring snaps over, and the point is driven through a soft spot in the metal of the can. The liquid promptly spurts through the perforations, smothering the fire.

Science News Letter, September 16, 1944

ASTRONOMY

Perseid Meteor Display Up to Average This Year

➤ THE PERSEIDS, the annual mid-August meteor shower, was up to average this year, judging by reports received by Dr. Charles P. Olivier, president of the American Meteor Society.

The best record for the shower was received from Shawnee, Okla., where Lieut. R. J. Wood, U. S. N. R., organized an observing group and counted 1,250 "shooting stars" in four nights of sky-watching. Among the meteors seen were several fire balls of great brilliance.

More than 50 reports from observers have been received.

Science News Letter, September 16, 1944

CHEMISTRY

New Method Increases Synthetic Rubber Output

➤ FORTY per cent increased output in synthetic rubber plants in the United States producing GR-S rubber is now possible by a new process developed by the Goodyear Tire and Rubber Company. It is a continuous polymerization process to replace the older so-called batch type of operation.

GR-S rubber is made by polymerizing or uniting the molecules of two materials, butadiene and styrene. It is done in large glass-lined tanks known as reactors. The temperatures in the reactors must be carefully controlled. In the batch type operation, each reactor is handled as a separate unit.

In the new continuous process method, the reactors are connected together by pipe lines in groups to form a continuous chain. Carefully timed pumps admit the ingredients in a continuous stream in the exact portions needed. The reaction takes place as the mixture moves through the chain of reactors and GR-S latex pours forth from the last one in a constant stream. Ingenious controls keep the temperature exactly right in each reactor. They are operated 100% full at all times, instead of 90% full as in the batch method, and no time is lost in filling or emptying the glass-lined tanks.

Science News Letter, September 16, 1944

AERONAUTICS

Auxiliary Fuel Tanks of Canvas Have Been Devised

➤ TO SAVE space and weight in shipping, as well as cost in use, a new-type auxiliary tank for airplanes has been devised by Capt. Christian Kurrle of the Army Air Forces, who has assigned rights in his patent, No. 2,355,084, royalty-free, to the United States government.

The tank, of the conventional streamlined bomb shape, is stitched together out of canvas or other suitable fabric instead of being made of metal or plywood, as most belly tanks are now. It can therefore be shipped in a collapsed state, baled together in quantities, which affects a great saving in space over the present rigid tanks. The inventor also states that his fabric tank costs very much less to make. Since belly tanks are almost never recovered after being jettisoned, this in itself is an important consideration.

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CHEMISTRY

New Wonder Plastic

New family of synthetic resins, called silicones, is giving waterproofing, flame-resisting service in planes and radios at the front.

By CAROLINE PARKINSON

See Front Cover

➤ A NEW family of synthetic resins, called silicones, is giving waterproofing, flame-resisting service in planes, radios and other machines operating at the front. Released for civilian use, the new substances promise renewed life in electrical equipment of home and factory.

By crossing slippery organic compounds with the gritty components of sand and glass, the creators of silicones have produced a hybrid synthetic which is more stable than any of the insulating substances used before. From the silicon, or glass chemical side of its family, it inherits resistance to water, air and temperatures as high as 500 degrees Fahrenheit. From the organic side comes the ability to form resins, greases and fluids, for use in all kinds of machines.

Electrical equipment can now get a 400-year lease on life. Tests show that a trolley car motor with silicone insulation could be kept in continual operation for 3000 hours at 482 degrees Fahrenheit, which is equal to 400 years of service at the ordinary temperature.

Motors of the future will be small but mighty. A ten horsepower motor, using featherweight silicone insulation, occupies no more space or weight than a three horsepower motor with the old type insulation. Methyl chlorosilane—"Dri-Film"—is being used in radio insulation, enabling a plane to make rapid dives into humid atmospheres without danger of short circuit from moisture seeping through.

New Role for Silica

Water droplets, which are absorbed by ordinary filter paper as shown at the right in the photograph on the front cover of this SCIENCE NEWS LETTER, are shed by the paper at the left, which has been treated with Dri-Film. The photograph is by Fremont Davis, Science Service Staff photographer.

Silicone oils which do not solidify at fifty degrees below zero, Fahrenheit, and are still giving service at 400 degrees above, are now lubricating fighting machines.

Most people think of silica as the substance that gets between their toes on the beach, and goes into making a glass window pane or a piece of sparkling crystalware. Its new role in the formation of sticky, gluey resins, and in stop-cock greases comes as less of a shock, however, when it is known that silicon is the closest relative, chemically speaking, of carbon, and therefore it has many properties in common with the element around which most of the plastics, oils, and other organic compounds have been built heretofore.

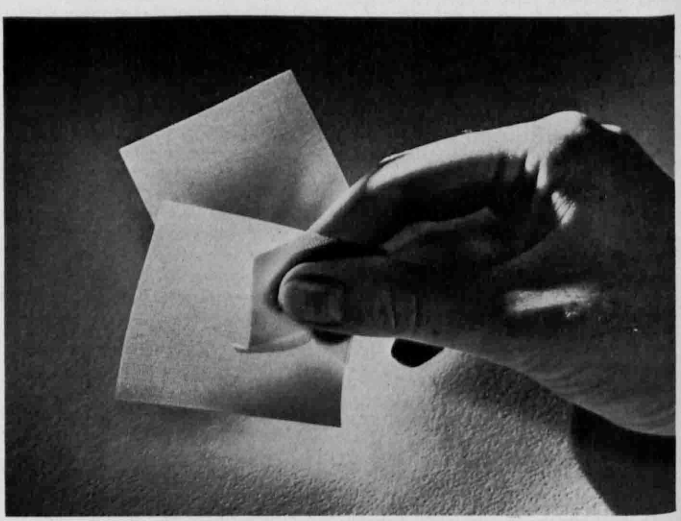
The ability to link with itself and form long chain molecules, the property which makes carbon king of the entire field of organic compounds, appears in the three other members of its immediate chemical family—silicon, titanium and germanium. Carbon can form the longest chains, as many as 500 carbons linked together; silicon comes next. Then come titanium and germanium, which have also been considered as constituents of new resinous products.

The new entrant into the backbone of organic compounds has the advantage of being the most abundant electropositive element on the earth's crust. Sand and various forms of quartz, rock crystal, amethyst, rose quartz, and milky quartz are all made of silica. Many of our common rocks contain silica.

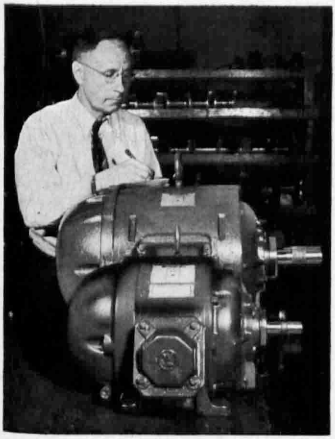
Silicone Chemistry

The silicon compounds which man has found most useful before this are the forms used in concrete for building and in ceramics. It has taken a hundred years of laboratory research to utilize the rare qualities of organic-like silicon compounds in products such as those which have emerged during this war.

The first step in silicone chemistry is to get it into a form which will react with desired organic compounds. This is usually silicon tetrafluoride or silicon tetrachloride, analogous with carbon tetrachloride. It is made by passing chlorine over a strongly heated mixture of silica and carbon.



INCREASES RESISTANCE—Silicone varnishes developed by Dow Corning Corporation are used on Fiberglas to increase its resistance to heat and moisture.



INCREASED POWER—Without increase in operating speed, the small electric motor in the foreground produces the same horsepower as the larger motor. Silicone insulation, which withstands higher operating temperatures, is responsible for the increased power.

Silicone chemistry began as a laboratory curiosity in 1846 when a scientific journal carried the report of the successful attempt to displace the four chlorines in silicon tetrachloride with organic radicals. It was done by adding silicon tetrachloride dropwise to anhydrous ethyl alcohol, cooled in a freezing mixture. The resulting compound, ethyl orthosilicate, reacted with water vapor to form silica gel, which varied in viscosity and other properties with the amount of water which was added.

Years later orthosilicates formed in this way were used in the manufacture of a paint, which upon hydrolysis would leave a hard coating of silica, or sand. A pioneer product in commercial silicones, the paint appeared in 1934.

In most cases organic groups will not combine directly with silicon. For sixty years, from the middle of the nineteenth century to the beginning of the twentieth, silicone chemists sought a desirable way to make this transfer. Organo metallic compounds such as those of zinc and mercury were used first. In 1885, it was found that sodium metal in a mixture of silicon chloride and certain organic chlorides would attach the organic groups to the silicon more simply and easy.

The question finally received a satisfactory answer in 1904 when Prof. F. S. Kipping, of Nottingham University, England, discovered that the organic compounds of magnesium, called Grignard reagents, offered a convenient, easily controlled method.

Industrial research laboratories entered the heretofore "academic" field of silicone chemistry about ten years ago. From the troublesome "glue-like" polymers discovered by Professor Kipping, they developed insulating resins which would allow electrical equipment to operate at temperatures never dreamed of with the old type of insulation. Six patents on such resins were issued to General Electric Co.

See SP 9/10/44 further information

Water Repellent Film

Merely exposing the surface of cotton, paper or glass to the vapor of methyl chlorosilanes was found to leave a water-repellent film which withstands washing, dry cleaning and even considerable abrasion. Treating the ceramic insulators in aircraft radios with this Dri-Film, developed by General Electric, has been one of its many uses.

Dow Corning Corporation has developed silicone oils which stay fluid at the temperature of dry ice and are still usable at temperatures up to 400-500 degrees above zero Fahrenheit. Their fluids come in twelve different viscosity grades, ranging from one for use in bearings that must function at temperatures as low as 70 degrees below, to another for use at 500 degrees above. Their stability is much higher than that of petroleum oils of the same viscosity. They do not corrode metals or swell natural or synthetic rubber. They are resistant to oxidizing solutions, mineral acids, salts and alkalies.

Compass liquids, hydraulic fluids that act as damping fluids to prevent vibration of indicators or pointers on instruments, and surface treatment of ceramics to reduce surface conductivity are some of the uses for liquid silicones. The water-white liquids were first limited to secret war uses but recent expansion in production by the Dow Corning Corporation makes them available for any war use indicated by their unusual combination of properties.

According to directors of industrial research laboratories working on silicones, practical applications of this new field of chemistry have just begun to be made. More surprising developments are ready to be announced soon. Silicones will continue to improve electrical equipment long after the war.

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MEDICINE

Nerve-Crushing Operation Tried for Chronic Polio

➤ ENCOURAGING results with a nerve-crushing operation in the later stages of infantile paralysis and in chronic cases were reported by Dr. J. Wayne McFarland, Lieut. Comdr. Harvey E. Billig, Jr., Dr. G. Mosser Taylor and Dr. Clarence W. Dail, of the College of Medical Evangelists, Los Angeles, at the American Congress of Physical Therapy in Cleveland.

The basis of the operation, the doctors explained, is that nerve fibers that are injured will generate new nerve filaments. As these grow into a weakened muscle fiber, these fibers, the doctors state, take on new life and vigor. If the branching is of large enough proportions, an increase in range of motion and muscle power can be demonstrated in the entire muscle group.

"Many of the old cases of infantile paralysis in which the original onset of the disease was three or four years previous, have shown remarkable ability to regain their function after neurotripsy (nerve crushing) has been done," the Los Angeles doctors reported. "Improvement in muscle strength occurred in 63% of 130 muscle groups studied.

"This work is still in the experimental stage, but the results have been encouraging enough to warrant further study and to make the method available to orthopedic surgeons throughout the country."

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Do You Know?

Skim milk, in liberal feedings, will rid young pigs of internal parasites.

Common *tungsten* ore fluoresces in ultraviolet light.

Aluminum is attacked by alkalies and is resistant to most acids; magnesium is attacked by most acids but resists alkalies.

A crop of *weeds* on idle land, plowed under, makes good green manure if the plants have not reached the seeding stage.

The acreage planted to *carrots* in the United States has increased sevenfold since nutrition specialists started pointing out the value of this vegetable in the human diet.

New varieties of *pineapples* are being developed in Brazil by crossing existing with wild and imported varieties to produce a plant without spines on its leaves.

The Allies, with *weather stations* in the United States, Canada, Greenland, Iceland, and the British Isles, are far better able to predict the weather in the battle areas than are the Germans.

A new German drug called *marsanil,* captured among other medical supplies, is understood to be a member of the sulfa group and intended for use in the treatment of gas gangrene.

The first *radiotelephony* station in the United States to give regular day-in, day-out public telephone service was established soon after World War I between California and Catalina island, some 30 miles off the coast.

Untreated standing *telegraph poles* showing signs of decay at the ground line can have their lives greatly lengthened by an application of sodium fluoride a foot below the soil surface and a mixture of creosote and coal tar extending upward three feet.

The nursery of many of the ducks, geese, swans and other *migratory waterfowl* that make their winter homes in the United States is in Canada; cooperation in wildlife conservation between these two countries is therefore important.

AGRICULTURE

NATURE RAMBLINGS

by Frank Thone

New Public Domain

➤ ARMY CAMPS, air fields, artillery ranges, proving grounds and other military installations require lots of space. Under the urgency of war, the federal government has acquired enormous holdings all over the country, but especially in the West and South. The total extent is not known exactly, but it is estimated at well over 20 million acres.

Once the war is over, most of this will no longer be needed. We shall probably maintain a much bigger army than we have in the past, and conduct more consistent and extended practice maneuvers. But we shall certainly not need or want to keep more than a fraction of our present wartime strength under arms. So Uncle Sam will have a lot of land on his hands.

First thought of many persons will be that this offers a fine opportunity to set returning veterans up as farmers. Sell them the land cheap, or give it to them outright as we did to veterans of the Civil War, when we still had whole statefuls of unclaimed land in the West.

Unfortunately, it won't be as simple as all that. In the first place, 20 million acres looks like a lot until you divide it by the number of men in the armed services. Then it works out as rather less than two acres per person. If we were to put it on the old-time basis of "40 acres and a mule," it would provide just about half a million men with farms.

That is, it would if all the land were fit for farming—but a great deal of it very definitely isn't. Relatively little of it, actually, is first-class farm land. More might be classified as second-rate farm land—really not good enough to support a family on 40 acres. And tremendous areas of it are and always will be utterly unsuited for farming—barren clay hills, sandy coastal plain and swampland in the South; desert, semi-arid brushland and overgrazed range in the West. A great deal of it, in both regions, is cut-over timberland, practically valueless until reforestation has been accomplished.

Before the government opens any of its acquisitions for resale to private owners, a scientific survey should be made. Only good farm lands should be turned over to veterans—it would be cruel to the men and bad public policy deliberately to set up a new mass of rural slums. Land suitable for reforestation or resodding should either be added to the national forests and rangelands, or converted into state forests or wildlife refuges. And the wholly useless land should be frankly labeled as such and written off the books.

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PUBLIC HEALTH

Malaria Epidemic Unlikely Army Authorities State

➤ LITTLE danger exists of any serious epidemic of malaria starting from soldiers returning from malarious theaters of the war, according to a statement from the War Department. The statement is based on a review of the situation by Major O. R. McCoy, chief of the tropical disease control division, preventive medicine service, Office of the Surgeon General.

The fear that once a soldier has had malaria, he will have it all his life was also debunked in the War Department statement. The most common type of malaria rarely lasts for more than one to two years, and three years is the maximum time under proper treatment.

The persistent, incapacitating effects of chronic malaria, such as are often seen in natives of highly malarious areas, have rarely developed in the Army, it is stated.

Atabrine has been found as effective as quinine and less toxic. Every soldier in a malarious area now is given a small dose of this drug six days a week. This controls the disease if he should contract it while in the lines and keeps him functioning as part of his unit. If the disease does develop, or appears after he is withdrawn to a non-malarious rest area, he is given larger, curative doses.

Soldiers are also taught to protect themselves against the malaria mosquito and are given mosquito netting, mosquito repellents and mosquito "bombs" to help in this fight against the disease.

The anti-mosquito measures on which civilians here in the United States rely for protection against malaria are expected to continue to give protection against spread of the disease.

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CHEMISTRY

Clue to Life Processes

Cold light produced by living cells may show the way to better understanding of sickness and health and better use of various drugs.

➤ COLD light produced by living cells, for example certain bacteria, may show the way to better understanding of life processes in health and sickness and to better use of various drugs to cure sickness, Dr. Henry Eyring and Frank Johnson, of Princeton University, told members of the American Chemical Society at their meeting in New York.

The brightness of light produced by luminous bacteria, they explained, depends primarily on the rate of a certain oxidative reaction. This in turn depends on the amount and physical state of a chemical called luciferase, which acts as accelerator of the reaction.

Luciferase is an enzyme typical of the many different enzymes on which depend the normal living processes of all living creatures including ourselves. Digestion of food, breathing, muscular exercise, growth, aging, and simply living depend directly or indirectly on the activity of enzymes.

By studying the effect of different temperatures and different chemicals, such as alcohol, acids and alkalies, on luminous bacteria scientists have learned how these agents affect the enzyme, luciferase. The action of drugs alone or in combination and with different degrees of temperature can now be calculated with some accuracy for a given enzyme system.

Science News Letter, September 16, 1944

Vitamin Content Determined

➤ CUCUMBER juice and bacteria are used for determining the true vitamin C content of foods in a method developed by Aubrey P. Stewart, Jr., and Paul F. Sharp, of the Research Laboratories of the Golden State Company, of San Francisco.

An enzyme in the cucumber juice, they discovered, destroys false vitamin C and the bacterial suspension converts dehydroascorbic acid into ascorbic acid. As a result, all the vitamin C in the food will be in the form of ascorbic acid, and a simple chemical determination will give the true value for vitamin C.

The presence of the vitamin in two forms and of the third chemical which is like the vitamin chemically but has no biological activity has heretofore caused difficulty in determining accurately the vitamin C value of foods.

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Good Forage Crops

➤ "NOT EVERYTHING in the way of a plant product with a high protein content is necessarily a good forage crop or grain feed crop," warned Dr. J. R. Haag of Oregon State College at the same meeting. He reported on experimental work carried out recently at the college. In his work various species of a legume genus known as Lathyrus were used. These include the ordinary sweet pea and many of the wild sweet pea forms.

In the tests rats were fed diets consisting of from 40% to 50% of each of eight species of such peas, and others fed diets of two common forage types of peas and one of vetch. His experiments revealed that most of these species produced toxic symptoms of lathyrism, such as have been reported with humans and farm animals fed on seeds from these plants.

Science News Letter, September 16, 1944

Three-Hour Test

➤ A NEW method for estimating the amount of certain vitamins in foods, pharmaceuticals and even human tissues which can be done in three hours instead of 48 hours or longer was reported by Lawrence Atkin, William L. Williams and Dr. Charles N. Frey, of the Fleischmann Laboratories.

The test depends on the growth response of lactic acid bacteria to the presence of five members of the vitamin B group, riboflavin, niacin, biotin, folic acid and pantothenate. So far, it has been applied only to niacin.

Doctors may even, the scientists believe, be able to use the method to analyze a microscopic portion of the patient's flesh for diagnosing vitamin deficiency and following the results of treatment.

The growth of bacteria in response to a given vitamin is usually estimated by a titration of the acid produced. In the method reported, the Warburg manometric apparatus is used. The calculation of the amount of vitamin is made from a measurement of the amount of carbon dioxide gas produced by the formation of acid in a medium containing bicarbonate. Very small gas volumes can be measured in this apparatus and consequently the vitamin assay method becomes very sensitive.

Science News Letter, September 16, 1944

Determines Flavor

➤ THE VOLATILE components in foods are often the ingredients that give interest and character to food flavors, declared Dr. E. C. Crocker of Arthur D. Little, Inc., Cambridge, Mass., at the same meeting. Control exercised over them should have practical value.

Volatile flavoring substances, he said, are ordinary chemical substances in most respects. They are distinguished by their ability to stimulate appropriately the receptors of smell and taste. They are of many chemical types such as hydrocarbons, alcohols, aldehydes, acids, esters, phenols, amines, and even mercaptans, variously distributed in different kinds of food.

Frequently, the volatile flavors are associated with water in the food, he continued. As the water evaporates there is a loss of the volatile substance.

Science News Letter, September 16, 1944

Books of the Week

➤ TIMELY, practical information on a subject many laymen and women as well as physicians are concerned about today is given by Henry J. Southmayd and Geddes Smith in SMALL COMMUNITY HOSPITALS, *(Commonwealth Fund,* $2). The material is drawn from the Commonwealth Fund's experience through many years during which it helped with the building and running of 13 rural hospitals.

Science News Letter, September 16, 1944

➤ SYNTHETIC RUBBER producers and users will find valuable information in SYMPOSIUM ON THE APPLICATION OF SYNTHETIC RUBBERS just published, *(American Society for Testing Materials,* $1.50). It contains the technical papers presented by authorities in various fields at the Cincinnati 1944 spring meeting of the society.

Science News Letter, September 16, 1944

➤ FUNDAMENTALS of the engineering side of air conditioning, incorporating many of the latest practices, are presented in a concise, readable text by Prof. Burgess H. Jennings, of Northwestern University, and Samuel R. Lewis, Past President of the American Society of Heating and Ventilating Engineers in AIR CONDITIONING AND REFRIGERATION, Second Edition. *(International Textbook,* $4.50.)

Science News Letter, September 16, 1944

➤ STARCH and the important products derived from it are discussed in a summary for carbohydrate chemists and technologists in CHEMISTRY AND INDUSTRY OF STARCH, *(Academic Press,* $8.50). Fourteen well known authorities contributed to the volume, which was compiled under Dr. Ralph W. Kerr, editor.

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Just Off the Press

THE CHEMICAL INDUSTRY—Josephine Perry—*Longmans,* 128 p., illus., $1.75. America at Work Series.

COMMERCIAL FLOWER FORCING: The Fundamentals and Their Practical Application to the Culture of Greenhouse Crops—Alex Laurie and D. C. Kiplinger—*Blakiston,* 598 p., illus., $4.50.

GLOBAL EPIDEMIOLOGY: A Geography of Disease and Sanitation—James Stevens Simmons and others—*Lippincott,* 504 p., illus., $7. Vol. 1.

HANDBOOK OF AIR NAVIGATION—W. J. Vanderkloot—*McGraw,* 331 p., illus., $1.25.

MODERN RADIO—Kingdon S. Tyler—*Harcourt,* 238 p., illus., $3.

NATIONAL FIRE CODES FOR THE PREVENTION OF DUST EXPLOSIONS—*National Fire Protection Assoc.,* 176 p., illus., paper, $1.

PIPELINE TO BATTLE: An Engineer's Adventures with the British Eighth Army—Major Peter W. Rainier—*Infantry Journal,* 305 p., paper, 25c.

PLIOCENE FLORAS OF CALIFORNIA AND OREGON—Ralph W. Chaney, ed.,—*Carnegie Inst.,* 407 p., illus., paper, $4.50. Contributions Paleontology, Pub. 553.

A REPORT ON SYNOPTIC CONDITIONS IN THE MEDITERRANEAN AREA—Staff Members of the Institute of Meteorology—*Univ. of Chicago Press,* 138 p., illus., paper, $1.50.

SCIENCE IN CHILDHOOD EDUCATION—Gerald S. Craig—*Teachers College, Columbia University,* 86 p., paper, 60c. Practical Suggestions for Teaching Series, No. 8.

THIS IS THE NAVY: An anthology—Gilbert Cant, ed.,—*Infantry Journal,* 220 p., paper, 25c. Fighting Forces Series.

ULTRA-HIGH-FREQUENCY RADIO ENGINEERING—W. L. Emery—*Macmillan.* 295 p., illus., $3.25.

Science News Letter, September 16, 1944

PLANT PHYSIOLOGY

Natural Gas Harmless to Plants and Cut Flowers

➤ NATURAL GAS was found noninjurious to growing plants and cut flowers, in experiments by Prof. Felix G. Gustafson of the University of Michigan. In this it is radically different from manufactured gas, which has long been known to be very harmful to plants growing in homes and greenhouses, as well as to certain kinds of cut flowers.

Prof. Gustafson placed potted plants of tomato, coleus, sunflower, snapdragon, marigold and several other species, as well as cut flowers of tulip, carnation and stock, under bell-jars. In some of the bell-jars from one to two per cent of Texas natural gas, taken directly from the pipe line, was added to the atmosphere. Other jars were left with only ordinary air in them, as controls.

Although the plants were exposed to the natural gas for several weeks, none of them developed detectable injury in the one per cent gas atmosphere, and only two of the cut specimens of plants showed damage in the two per cent concentration.

As a further check, manufactured gas was added briefly to some of the bell-jars containing natural gas. The plants promptly showed signs of gas injury, but recovered when the manufactured gas was taken out and only natural gas remained.

Science News Letter, September 16, 1944

Shrimp production along the coast of the gulf of Mexico increased 50% in June over May; 1944 production for the first six months is still 28% below 1943 figures.

INVENTION

Rotating Bands Affixed By Powder Metallurgy

➤ AFFIXING rotating bands to shells by a powder-metallurgy process is the basis for patent 2,353,693, obtained by Lt. Col. Joseph H. Church of the U. S. Army and assigned to the government.

A mixture of powdered metals, usually copper and nickel, is placed in a containing collar around the base of the shell and pressed until it sticks as a ring. Then it is placed in an annular induction-heating coil until the powdered metals are sintered. Still porous, the ring is next dipped in a bath of molten copper, which soaks into the chinks and brings the ring to approximate solidity. Finally, the ring is machined to proper shape.

Science News Letter, September 16, 1944

•New Machines and Gadgets•

❁ *FRUIT collector, to catch the windfalls from the tree without severe damage, is a circular canvas surrounding the tree supported on adjustable legs. Fallen fruit rolls to the center of each of the six baggy sections of the canvas and passes through round center holes into baskets.*

Science News Letter, September 16, 1944

❁ *CIGARETTE-MAKING device, in combination with a tobacco box, humidor, cigarette paper, paper moistener, and package of matches, is small enough to carry in a lady's handbag or a man's pocket. With it a novice can make high-quality cigarettes under sanitary conditions, it is claimed.*

Science News Letter, September 16, 1944

❁ *MIDGET MOTORS, weighing 32 pounds and capable of 28,000 revolutions a minute, crank 2,000 horsepower aircraft engines. They first revolve counter clock-wise, turning their five-pound flywheels through gears in a clock-wise direction. When a specified speed is attained, they reverse and apply direct acceleration to the wheels.*

Science News Letter, September 16, 1944

❁ *FLYING bazookas, attached to the wings of American dive-bombers, launch deadly rockets at land, sea and air targets. The three-barrel unit shown in the picture is a giant compared with the anti-tank bazooka carried by infantrymen.*

Science News Letter, September 16, 1944

❁ *BOTTLE CAP remover uses one bottle as a lever to lift the cap from another. In this patented device a metal strip with a hooked end to grasp under the edge of the cap is fastened to the neck of the lever bottle with a metal sleeve.*

Science News Letter, September 16, 1944

❁ *ELECTRIC fan to deliver a large volume of air in a straight line is enclosed in a somewhat elongated heavy-gage welded-steel housing mounted on an adjustable pedestal. Unlike ordinary fans, its air discharge expands or spreads very little.*

Science News Letter, September 16, 1944

❁ *PLASTIC lenses, to direct the landing light to guide pilots at temporary military airfields, are made, for the approach lens, of three strips of colored transparent lucite welded together in a horizontal plane. Obstacle lights have distinctive red transparent lenses.*

Science News Letter, September 16, 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 225.*

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