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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • SEPTEMBER 25, 1943



The "Bazooka"

See Page 195

A SCIENCE SERVICE PUBLICATION

Do You Know?

Lime in cement floors may cause fiber rugs to fade and turn yellow.

A larger allotment of *copper wire* for farmstead wiring is now available if to be used for essential food production.

Australia is planning to grow twice as much *vegetable foods* in its summer season now approaching as it did a year ago, particularly to help feed Allied forces in the South Pacific.

Over 4,600,000 acres of national *wild-life refuge* land in 18 states are being used by military authorities for bombing ranges, gunnery ranges, air bases, tank maneuvering areas and other purposes.

Agar-agar, formerly obtained from Japanese and Chinese *seaweed* and used in the artificial cultivation of bacteria, is now a scarce material; the U. S. Bureau of Fisheries is searching for American agar-producing seaweeds.

The Army is using more and more *boneless beef*, frozen in containers, instead of carcass beef as a field meat ration; the Army boneless meat is prepared in three classification: steaks and roasts, boiling pieces and ground meat.

Lactic acid which makes sour milk sour is a valued material in several industrial, medical and food uses; it is used in tanning, in carbonated beverages and feeding formulas for babies, and as calcium lactate to supply lime to the body.

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Most articles which appear in SCIENCE NEWS LETTER are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.

Frozen food locker plants with compartments for private families are available in 4,600 communities in 46 states and handle about a half billion pounds of meat, fruits and vegetables a year.

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Sneet and trap shooting occupy important places in the gunnery training of Army air fighters; it gives them initial contact with the art of swinging and following through on a target.

SCIENCE NEWS LETTER

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MEDICINE

War Against Disease Won

With the aid of vaccines, Army scores almost 100% victory against ills for which inoculation can be used.

THE United States Army has won an almost 100% battle for its overseas troops in combatting diseases against which the Medical Corps has been able to use inoculations.

Reports to the War Department covering periods up to the year ending in July from the Middle East, North Africa and China-Burma-India Theaters of Operations show this remarkable record:

CBI Theater: Cholera, tetanus, smallpox — no cases. Typhus — 1 case, no death. Typhoid—12 cases, one death.

Middle East and North Africa Theaters: Typhus—4 mild cases, no deaths.

The report from North Africa and the Middle East dealt only with typhus, scourge of armies down through history. It was particularly revealing inasmuch as these two areas are fertile breeding places for typhus which is flea-borne and louse-borne. Several severe epidemics of typhus were reported among civilians in these two theaters where many communities were "100% lousy." American troops, however, remained singularly free of the disease although their operations often forced them to mingle closely with the natives.

Colonel Harry Plotz, specialist on infectious diseases, spent the last seven months in the Near East working primarily on typhus and, on his return to the United States, brought back 69 new living strains of the typhus germ and 4,000 types of serum from civilian patients recovering from the disease. This material will be used in various laboratories for possible development of better vaccines.

Colonel Plotz pointed to the immunity of American forces today as against civilian and military records of the last war which he said showed 10,000,000 known cases of typhus in Europe with 5,000,000 deaths.

Medical authorities in the CBI Theater are particularly proud of their record against cholera, which is always dreaded in the Orient; but they are just as proud of the typhus record.

As in other theaters, protection of troops does not stop at inoculations. There is a constant program of protective and preventive measures. Water sup-

plies are watched and either boiled or chlorinated; unsanitary places are placed off-limits, messes are regularly checked and food handlers inspected; and every effort is made to keep to a minimum the growth and spread of insects and vermin.

Not long ago tetanus was the most common complication of a battle wound, caused principally by contamination from soil. Now, tetanus vaccines and prompt surgical treatment are saving hundreds of lives and restoring soldiers to full health with great rapidity. Every soldier gets three tetanus vaccines when he enters the Army and regular booster shots thereafter.

In the fight against cholera, the soldier going overseas receives two injections seven days apart and as long as he remains in an area where cholera may be prevalent he is given a stimulating shot every six months. Typhoid vaccines, too, are given immediately upon a soldier's entrance into the Army and a stimulating shot is given every six months while he is in a typhoid area. Three injections are given for typhus and a stimulating shot then given every six months.

All in all, the health of American troops overseas has been excellent and, under ordinary battle conditions, may

be expected to improve as new protective and preventive measures are tried out and put into practice.

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MILITARY SCIENCE

"Bazooka" Rocket Gun Now Supplied in Quantity

See Front Cover

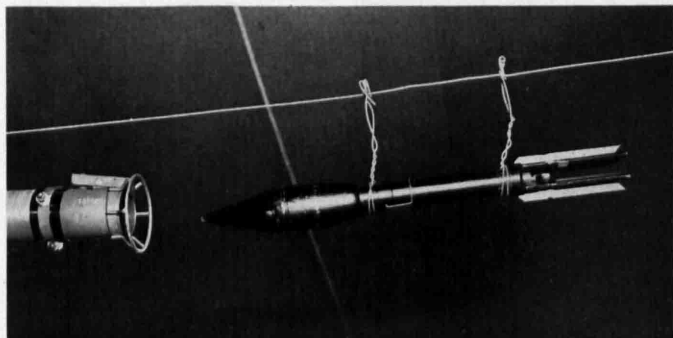
THE "BAZOOKA," a gun whose rocket projectile is effective against any enemy tank which has been in action against United Nations' forces, now is being supplied in quantity by the United States to American and other United Nations' troops, the War Department has announced.

The "Bazooka" has been in action for several months on various foreign fronts, and is effective against thick brick walls, rock masonry, structural steel and railroad rails as well as against enemy tanks.

During the recent North African campaign, "Bazookas" of one United States Army division alone destroyed at least six enemy tanks.

The "Bazooka" launcher, or gun, is a metal tube somewhat more than 50 inches in length and less than three inches in diameter. It is open at both ends. Attached to the tube are a shoulder stock and front and rear grips for the firer, together with sights and an electric battery which sets off the rocket-propelling charge when the launcher trigger is squeezed. There are also safety devices.

The launcher is operated by a two-man soldier team—one the firer, the other the loader. When the launcher is



"BAZOOKA" ROCKET—Plainly a rocket, with fins like an aircraft bomb, is this projectile used in the new "Bazooka" gun. This photograph, taken by Fremont Davis, Science Service staff photographer, shows the rocket as it was exhibited by the Army in Washington, D. C.

held in firing position, the loader is at one side and to the rear of the firer as shown in the illustration on the front cover of this week's SCIENCE NEWS LETTER. The launcher may be fired from any position which may be used normally by a rifleman in combat.

After the loader has inserted the rocket in the launcher, he turns a contact lever to the "fire" position, signals "ready" to the firer, and then drops down and away from the rear end of the launcher

and grasps a new rocket.

When the firer squeezes the trigger, the rocket-propelling charge is ignited and flashes from the rear of the launcher tube.

The rocket itself is heavier than the hand grenade and is nearly two feet long. It looks like a small, elongated aircraft bomb. It has an explosive head, propelling charge powder tube and a finned tail to provide accuracy in flight.

Science News Letter, September 25, 1943

ASTRONOMY

New Comet Discovered

Diamaca, named after its Roumanian discoverer, will probably be visible with small telescope in northern evening sky near Hercules.

► A NEW comet, named Diamaca after the Roumanian astronomer who discovered it, was reported low in the northern part of the evening sky near the constellation of Ursa Major, the great Bear.

The comet was first noticed in Roumania early in the morning of Sept. 10. Due to the difference in time, this was actually 10 p.m., EWT, on the night of Sept. 9. It was found to be moving toward the northeast.

At the time of its discovery, the comet's right ascension was 8 hours, 35.4 minutes, according to the cabled report received by Dr. Harlow Shapley, director of Harvard Observatory, American clearing house for astronomical reports, who has relayed the discovery news to American observatories. Its declination was plus 53 degrees, 1 minute.

The comet was observed on Sept. 18 in America by Leslie C. Peltier, amateur astronomer of Delphos, Ohio, who found it had dimmed from the reported eighth magnitude to tenth magnitude and it was moving about twice as fast as the original report indicated. Mr. Peltier made his observation independently before he had heard of the Roumanian report. The predicted position for the evening of Sept. 24 is 16 hours, 45 minutes, and 34 degrees which places it inside the Keystone in Hercules.

Evening is the best time to observe the comet through a telescope, of course. In fact, the comet will soon begin to set a few hours after the sun.

Care should be taken not to confuse the comet with the numerous bright galaxies or spiral nebulae in this part

of the sky near which the comet may pass.

The message of the discovery came from Zurich, Switzerland, via the observatory at Copenhagen, clearing house for astronomical information in Europe. Usually such messages are relayed to the United States via Sweden. It is not known whether the Nazi control of Denmark prevented its transmission to Sweden, or whether German-Swedish communications are limited.

Science News Letter, September 25, 1943

ANTHROPOLOGY

Scientists Help Troops to Get Natives to Cooperate

► ACTIVE assistance of natives in some of the most remote regions where our troops are now fighting is being secured by anthropologists.

They are also helping organize tribes to gather rubber so vitally needed for our war production, and to help stimulate local crop production to feed our troops in these distant sections, Dr. Ruth F. Benedict, associate professor of anthropology at Columbia University, stated in Science Service's "Adventures in Science" program over the Columbia Broadcasting System.

Approximately 5,700 tons of steel has been saved by limiting to two inches or less the length of women's hair pins and bobby pins.

Electricity for lighting store windows and fronts is banned in Australia.

Anthropologists have first-hand knowledge of strange parts of the world, which is proving most useful to the Allies. They know what native foods may be safely eaten and have detailed knowledge of the topography of little-known regions. Based on native practices, some are offering valuable suggestions as to how to clothe or shelter our troops most expeditiously and comfortably. Others are giving courses in languages never before taught in America.

"The fact that anthropology is so useful in down-to-earth, practical operations came as a shock even to many people who know a good deal about anthropology," stated Dr. Benedict, who is herself helping Uncle Sam win the war. More than half of these scientists are devoting their full time to the war effort and another quarter are doing part-time war work.

"The anthropologist has one great qualification for post-war planning for he finds cultural differences interesting," Dr. Benedict pointed out. "He looks over the contemporary cultures of the world and it seems quite possible to him that the special values of each of them could be maintained and enhanced in a post-war world."

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MEDICINE

Flea Bite Allergies Are Relieved By Vaccine

► SUCCESSFUL vaccination against the hives and asthma some people get from flea bites has been achieved by a flea antigen developed at the University of California, Dr. Barbara C. McIvor and Dr. L. S. Cherney of the University Medical School announced.

Fleas are a serious threat to health because they may carry the germs of typhus fever and plague. The flea antigen is not directed against this danger, but to the severe reactions some people have from bites of non-infected fleas.

In California, North Africa and probably other parts of the world the flea is a pest aside from its disease-carrying danger, just as mosquitoes are. In such regions the antigen should prove a boon to hypersensitive persons.

In the University investigations 115 out of 128 patients were relieved of symptoms by the vaccination. Three failed to complete the course of treatments. Trials by 41 doctors in other parts of the country showed that all but five of 92 patients were helped.

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MEDICINE

Short Impetigo Treatment

Indian dislike of bandages combined with medical skill resulted in new 24-hour conquest of persistent skin infection.

FROM a combination of Indian dislike of bandages and medical skill has come a 24-hour conquest of one of the most persistent of skin infections, impetigo contagiosa.

The new treatment consists of placing on the sores a jelly consisting of 25% sulfadiazine in methyl cellulose. This mixture forms a water-soluble plastic coating over the lesions and obviates the need of bandages. The sulfa drug is effective in healing the surface sores caused by the impetigo bacteria and seldom is more than one application necessary.

A husband and wife team, Dr. M. Pijoan and Mrs. J. Pijoan, together with F. Worman, working at the U. S. Indian Service Nutrition Laboratory and University of New Mexico, developed the treatment (*Southwestern Medicine*, May). Since the work was done, Dr. Pijoan has been commissioned a lieutenant in

the Navy and is on the research staff at the Naval Medical Research Center, Bethesda, Md.

Treatment of impetigo afflicting Indian patients was found by Dr. Pijoan to be particularly difficult because they consider bandages over skin sores somewhat of a disgrace. The patients tore off the dressings once they were out of sight of the doctor.

A search was begun for a method of treatment that did not require bandages. It resulted in the sulfadiazine-methocel dressing. Earlier researches showed that sulfonamide ointments or microcrystals gave striking results, while sulfa drugs in methyl cellulose had been used successfully in treating burns. The new impetigo treatment was developed from both techniques.

Controlled tests on a hundred Spanish-American school children showed the effectiveness of the treatment.

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MEDICINE

Sulfa Saves Newborn

Latest triumph of useful family of drugs is the rescue of babies from blindness and from death due to epidemic diarrhea.

SAVING NEWBORN babies from blindness and death are the latest triumphs credited to the sulfa drugs in medical reports.

Epidemic diarrhea of the newborn is the killing disease from which babies are now being saved by succinylsulfathiazole. This infant killer usually strikes before the baby is a month old, often before he has left the hospital where he was born. Many a hospital has had to close its nursery temporarily while the staff tried frantically to check the epidemic and to find a way of preventing future ones.

The triumph of succinylsulfathiazole in this baffling disease is reported by Dr. Allan H. Twyman and Dr. George R. Horton, of Indianapolis (*Journal, American Medical Association*, Sept. 18).

Knowing that this comparatively new sulfa drug was especially good at fighting germs in the intestinal tract, these doctors used it for 11 babies suffering with epidemic diarrhea of the newborn. All but two of the babies promptly got well. The two deaths, the doctors believe, were due to inadequate dosage of the drugs.

As a check, 11 babies were given standard non-sulfa drug treatment for the same condition. Twice as many babies died, and those that recovered had to stay in the hospital under treatment almost twice as long as the sulfa-drug-treated babies. They did not catch up for 17 days to the weight gains made in eight days by the sulfa drug babies.

Anti-bleeding vitamin K must be given with the sulfa drug, the doctors

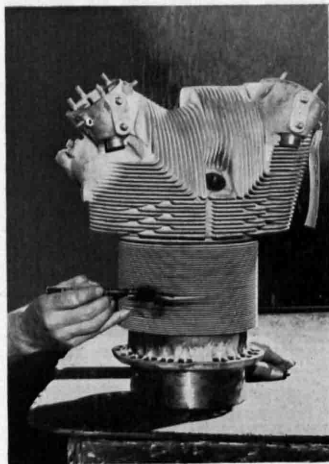
warn, because the drug reduces the number of bacteria normally in the intestines which help the body to absorb the vitamin.

"Babies' sore eyes," due to gonorrhea and frequently a cause of blindness, can be swiftly cured without complications and without relapse by sulfathiazole given by mouth, Dr. Marvin L. Blumberg and Dr. Morris Gleich, of Harlem Hospital, New York City, report to the same issue of the medical journal.

In spite of routine use of silver nitrate drops in the eyes of newborn babies, this eye disease continues to be a serious problem, they point out. Other methods of treatment take a long time to clear up the condition, when they do succeed, and are "exhausting," the physicians state.

With sulfathiazole in adequate dosage by mouth, the condition cleared up in one to four days. There was no need to treat the eyes themselves, except to wipe away pus, and the babies ate well and gained weight.

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BULLET-RIDDLED — Experts are studying this Wright Cyclone engine cylinder, back from "somewhere in the Pacific" (See *SNL*, May 23, 1942). The ragged hole is where a 50-caliber enemy bullet completely pierced the cylinder barrel. In spite of the puncture, the tough engine kept operating.

PHYSIOLOGY

When Thirsty—Drink!

This is the advice of scientists, based on new intensive research on the water needs of men stationed in desert climates. Many fallacies disproved.

► "WHEN you are thirsty—DRINK!" That is the advice of scientists who have been conducting intensive research into the water needs and habits of men stationed in desert climates such as at the Army Air Base in the Mojave desert, Blythe, Calif.

For weeks these scientists, working for the Office of Scientific Research and Development and under the sponsorship of the Quartermaster General's Department, have been making tests with a selected group of men to determine how much water a man stationed in the desert should drink and how he should drink it. These tests supplement similar work conducted last summer with Army Ground Forces.

Many old fallacies have been disproved and facts have been recorded by Dr. Edward F. Adolph and six associates from the University of Rochester.

"We measure the amounts of sweat lost from a man by his loss of body weight," Dr. Adolph said. "We find that a man who stops drinking water sweats about as fast as one who continues to drink what he wants. For a few hours, the non-drinker uses some of his body water to make sweat without missing it much. But thereafter he becomes exhausted if any more water is withdrawn from his body. Moreover, to feel comfortable again, he later has to drink the same quantity of water that he would have taken if he had not run into deficit. All the evidence known at present shows that a man cannot do without water, nor be trained to get along with less water.

"A man may fool himself unawares. He may get his water as pop at the PX instead of out of the water cooler or canteen. He may go to sleep and so need less water through less bodily exertion and exposure. He may contrive to work in the cool night instead of in the hot daytime. In such circumstances he might pooh-pooh the idea of a man needing more than a gallon a day. But the man who works in the sun needs two or three gallons in 24 hours in summer, and by no known method can he continuously get along on less.

"Water requirements of average men depend on their activity and on the daily temperature. Our measurements show that on days with maximum temperatures of 95 degrees Fahrenheit, a man must drink at least three quarts of fluid each day and one who works hard in the sun requires as much as seven quarts. On days when the temperature reaches 110 degrees, even the most inactive man (unless he is in an air-conditioned building) must have six quarts

MEDICINE

Degreasers Cause Death

Incidental discovery that vapors of chlorinated hydrocarbons affect the heart is believed to explain mysterious deaths and faintings in industry.

► SOME OF the mysterious deaths of industrial workers exposed to the vapors of the chlorinated hydrocarbons, widely used as degreasers of tools and machinery, are probably explained by findings reported by Dr. Arthur J. Geiger, of Yale University School of Medicine (*Journal, American Medical Association*, Sept. 18).

Trichloroethylene and carbon tetrachloride are among these chlorinated hydrocarbons. Besides its industrial uses, trichloroethylene has also been used as an anesthetic and in treatment of certain ailments. It was such a use which led Dr. Geiger to his discovery.

The workers who have lost consciousness and mysteriously died from exposure to these vapors died, he believes, because the chemicals caused ventricular fibrillation, a highly dangerous and usually fatal condition in which the fibers of the heart muscle contract individually instead of together. This kind of contraction is not sufficient to keep the heart pumping blood and unless the condition is promptly overcome, the patient will die. Death by electric shock is due to this damage to heart action.

"Profound loss of consciousness" and a disturbance of heart rhythm "of an ominous type likely to lead to fatal ventricular fibrillation" occurred in a pa-

tient being given trichloroethylene inhalations for migraine headache attacks. Dr. Geiger reports. The treatment was banishing the headaches and lengthening the intervals between attacks. At first the fact that the patient fell asleep for a few minutes during the treatment was not considered remarkable because the chemical was known to have an anesthetic effect. Then it was noticed that her pulse became rapid and completely irregular during the inhalation and that she was not merely asleep but so deeply sunk into unconsciousness that she could not be aroused and did not respond to painful stimuli.

Electrocardiograms showed the heart disturbance. The same condition occurred when carbon tetrachloride was substituted for trichloroethylene, but not when amyl acetate was given. The latter chemical, moreover, failed to relieve the headache as the chlorinated hydrocarbons did.

Greater vigilance in protecting industrial workers from even short exposures to moderate concentrations of the fumes of these chemicals is called for by Dr. Geiger, who adds a warning to physicians about the dangers of the medicinal use of trichloroethylene.

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sometimes

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BIOCHEMISTRY

Molds Make Analyses

Humble, but specially bred, red mold can outdo chemists at difficult job of determining concentration of one kind of amino acid in protein.

► MOLDS that can outdo skilled chemists at one special and difficult job of analysis were the strange creatures introduced to the American Chemical Society at its meeting in Pittsburgh, by Dr. Erwin Brand of Columbia University.

The task at which these humble but biochemically sensitive plants have worked is the accurate determination of the concentration of one of the building-blocks of protein in extracts of several protein varieties. With their aid it has been possible to make such determinations in a few days, whereas by previously existing methods a whole corps of highly trained chemists would have to work for months to achieve an equally accurate outcome.

The story begins with the creation of special physiological races of a red mold, botanically known as a *Neurospora*, in the laboratories of Dr. George W. Beadle at Stanford University. By X-ray treatment, a parent strain was induced to undergo evolutionary changes. Pure lines of descent of these new races were assured by isolating single reproductive spores and growing small "gardens" of mold from each one.

Some of these strains were physiologically very choosy. They required one kind of amino acid, one of the building-blocks of protein, and would not grow without it. One of the strains had to have the amino acid known as leucine. This is the one that Dr. Brand used in his researches.

Grown on nutrient preparations of various proteins, this "minus-leucine" strain of mold would develop a certain amount of weight for each per cent of leucine present in its food. Then it would stop. After giving it time enough to reach full growth, Dr. Brand and his associates would harvest the mold, dry and weigh it, and thus learn immediately what would otherwise have taken months of tedious toil.

The practical value of this kind of research is very great, but it will take years of continued effort to develop it fully. Protein analysis is one of the most difficult of all chemical jobs, yet it is important for such work to be done because proteins are not only the stuff

our muscles are made of but also many of the other important though less bulky constituents of the body, and many of the poisons that make us ill and the medicines that make us well. Snake and spider venoms are proteins, and also insulin and all the physiologically important gland extracts. So there is plenty of work ahead for both the chemists and their specially bred molds, for a long time to come.

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Vitamins from Wastes

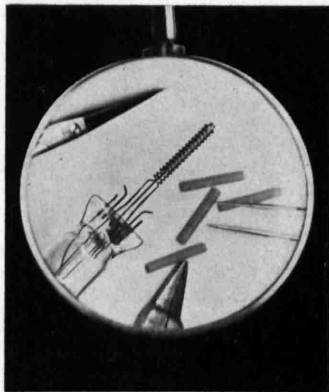
► OF PERHAPS more immediate interest was a report telling how two important vitamins, riboflavin and thiamin, can be recovered in quantity from brewery wastes, in which they are now lost down the sewer. Donald S. Herr, of the Resinous Products and Chemical Company, stated that if such fluids are passed through a mass of an insoluble synthetic resin known to the trade as Amberlite IR-100, ground into particles about the size of coarse sand grains, the two vitamins are all taken out and held tightly by the resin. Conditions can be so adjusted that both riboflavin and thiamin are retained, or the riboflavin permitted to pass and only the thiamin held. The vitamins can be subsequently released for use, by chemical means already well known.

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New Vitamin Possible

► THE POSSIBLE existence of a new food factor necessary for reproduction, believed to be different from the already-known vitamin E, was suggested by H. W. Schultz, R. E. Gray and H. E. Robinson of Swift and Company. The new vitamin (if that is what it is) appears to be present in meat, but is made useless by heating.

Cats were used in the experiments. Some were fed on raw meat, others exclusively on meat that had been highly heated. Tomcats fed on the heated meat sired no kittens during a period of three and four years. Female cats similarly fed



SPAGHETTI AT WAR — Photographed through a magnifying glass, this is the filament of a radio tube with a short piece of ordinary spaghetti inserted inside the wire coil. The spaghetti supports the coil in accurate alignment while it is being welded. Then the spaghetti is burned away by electric current sent through the coil. Using spaghetti saves 75 per cent of the time formerly required in filament assembly.

either had no kittens, or had very few, and those unhealthy.

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SPORTS

All-in-One Golf Club Has Adjustable Head

► WARTIME golfers, forced on caddyless golf-links to carry their own fighting clubs, are promised relief in one of the 510 patents issued this week by the U. S. Patent Office. The patent is on an "all-in-one" golf club, a single club with an adjustable head so that it may be used as a putter, driving iron, mashie, niblick, cleek or any other club desired.

The club has a shaft with a shank end, at the proper angle at the lower end, a "bearing portion" with a threaded end. A reversible club head fits on this bearing portion and is held in position by a quick operating nut. The face of the head may be set at various angles and may be turned over for a left-handed golfer. The inventor is Charles V. Winter of Barrington, Ill.; the patent is No. 2,329,313.

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PUBLIC HEALTH

Infantile Paralysis Cases Now Decreasing

► **ENCOURAGING** news from the health front appears in reports on infantile paralysis received at the U. S. Public Health Service.

The total number of cases for the week ending Sept. 11 is 868, a considerable decrease from the previous week's total of 956. The 868 figure includes only 45 of the 48 states. Rhode Island, New Jersey and Missouri, from which reports have not yet been received, reported only 50 cases between them last week, however, so are not expected to bring total up to last week's.

Illinois, with the largest number of cases, reported 189, a slight decrease from the 192 of the previous week. California and Texas, where the epidemic first appeared, continued to report decreases. Cases increased in Massachusetts, New York, Ohio, Michigan, Colorado and Oregon; decreased in Connecticut, Wisconsin, Utah and Kansas.

Science News Letter, September 25, 1943

PHARMACY

Better Sulfa Ointments Promised by Research

► **SUCCESSFUL** hunt for an all-purpose carrier for sulfa drugs when used in ointment form was reported to the American Pharmaceutical Association meeting in Columbus, Ohio, by Darwin Aldrich and Dr. H. G. Dekay of Purdue University's School of Pharmacy. If test-tube experiments prove out, treatment of a variety of skin infections and wounds may be improved.

Germ-fighting effectiveness of sulfa ointments now used seems to be affected by how the ointments are prepared. Tests showed that ordinary water is apparently a necessary ingredient. This confirms work of other experimenters that the water-holding type of ointment bases make the sulfa drugs most effective.

Taking the work a step further, Mr. Aldrich and Dr. Dekay came up with what appears to be an ointment base that can be universally used with any of the sulfa drugs to assure maximum effectiveness. This involves putting in a glyco monostearate chemical and adjusting the mixture to a slight alkalinity (about hydrogen ion concentration of 8.8).

Did the alkali itself make the oint-

ment almost twice as effective in killing staphylococcus germs in test-tube tests? Experiments showed that the alkali only paved the way for the sulfas to do their job, for a sulfa-free ointment proved to have no action against the germs at all.

Possible objections that alkaline ointments might be irritating do not seem to be borne out by clinical use of the ointments in eye infections.

The studies were promoted by queries from pharmacists who have been up against the problem of supplying physicians with a growing number of sulfa ointments in their most effective form. By bringing together all the factors involved in preparing such medicines, the researchers hope to simplify the pharmacist's work through use of a universal ointment base and benefit the patient as well.

Science News Letter, September 25, 1943

ENGINEERING

Speedier, Cheaper Service Promised to Teletype Users

► **MANY BUSINESS** offices and perhaps some newspapers using teletypes, the telegraphic typewriters, may have speedier, cheaper service by automatic switching of messages through subcenters. Details were disclosed to the American Institute of Electrical Engineers by F. L. Currie of Western Union Telegraph Co., New York, the company that originated the method.

Teletypes have long been beyond the reach of many offices, and even groups of offices. Individual line wires and equipment connecting with a central office boosted expenses too high.

Now a large group of users can be furnished printing telegraph service to and from a distant central office by sharing a small number of trunk wires which run into a subcenter. Here the messages are automatically switched to the proper individual wire provided for each user.

Such development is possible, Mr. Currie explained, because studies show that only a small percentage of patrons use the lines simultaneously. From such data, the correct number of trunk wires are installed to handle the expected peak volume of business at any one time.

Installations have already been made in some sections of the country, the engineers were told, and benefits include ease of operation, speedier service, saving of line wire expense and, in some instances, reduced operating costs.

Science News Letter, September 25, 1943

IN SCIENCE

CHEMISTRY

Aviation Gasoline Makers Develop New Process

► **ALL REFINERS** of 100-octane aviation gasoline may take advantage of a new method of manufacturing which will speed up the production of this essential high-test fuel for warplanes. This new process was developed by the Universal Oil Products Company in Chicago. This company has announced that it is releasing the new method to any refiner interested as a contribution to the war effort.

The process is a method of converting pentane into isopentane. Both of these compounds are contained in the base stock from which gasoline is made. Isopentane is an essential component of 100-octane gasoline. The amount of it in natural gasoline is not sufficient to make aviation gas, so what is called an isomerizing process is necessary to increase the amount by converting some of the normal pentane in the gasoline into isopentane. The newly discovered process does this efficiently and economically, it is claimed. It is reported to be simple, continuous in operation, and easily controlled.

Science News Letter, September 25, 1943

NUTRITION-INVENTION

Tasty Nut-like Confections Made From Soy Beans

► **TASTY** nut-like confections are made from the newly-popular soy bean, as well as other grains and seeds, by par-boiling in a sodium bicarbonate solution, then puffing them and removing part of the vegetable oils to make them more digestible. Charles A. Raymond of Marion, Ohio, has obtained patent No. 2,329,080 on the process.

Expansion of the beans is accomplished by soaking them in ammonium bicarbonate solution, heating them, then dipping the beans in hot oil. This causes the beans to expand explosively, breaking down the oil cells and forcing the oil to the surface where it is absorbed into the oil bath. A crunchy product results, the inventor states, which has a brownish, roasted appearance.

Science News Letter, September 25, 1943

E FIELDS

LANGUAGE

To Russians Uendel Uilki Lives in Niu lork

► WENDELL WILLKIE in Russian is "Uendel Uilki", and New York is "Niu lork," the late Dr. Ales Hrdlicka of the Smithsonian Institution pointed out (*Science*, Sept. 10). The reason is that the Russians have no "w," its place being taken usually by "v." In English names, however, they use "u" instead of "v." This is perhaps an honor because in the transliteration of German names they use the "v."

"For some unknown reason the Russian, alone among the Slavic and other European languages, has no 'h', though the sound is present in the Ukrainian and other Russian dialects," he stated. Houston, therefore, is "Giustn," Ohio is "Ogio," and Hall is "Gol." "Th" is replaced by "f," so that Thomas becomes "Foma."

These substitutions of letters make Russian difficult to foreigners, and also make it more difficult for Russians to learn other languages. Dr. Hrdlicka suggested that, at least in scientific publications, Russians use foreign names as they are and in italics.

Science News Letter, September 25, 1943

MILITARY SCIENCE

Japs Using Submarines To Supply Troops

► JAPANESE forces on southwest Pacific islands, their ordinary shipping harried by increasingly powerful Allied air attacks, are receiving supplies by submarine as well as by self-propelled barges. Col. Conrad H. Lanza states (*Field Artillery Journal*, September).

"The Jap submarines used for supply purposes," Col. Lanza says, "are of 400-ton and 1,000-ton sizes. The smaller carries about 40 tons of freight and the larger as much as 400 tons, partly lashed to decks. They carry no armament. This type of vessel is really a submersible barge, and is used close to the front—particularly to supply Jap posts near Salamaua and Lae."

Col. Lanza makes no mention of these cargo-carrying submarines as operating in any other war zone, but disclosure of their existence inevitably

arouses speculation as to whether they may not have had a part in the evacuation of Kiska.

Unarmed, cargo-carrying subs are not quite a new thing under the sea. During the first World War, a large German boat of this type, named the *Deutschland*, created something of a sensation by popping up in Chesapeake bay and docking at Baltimore, while this country was still neutral. She carried a cargo of drugs and dyestuffs, and returned with a load of rubber. Subsequently it was reported that she had also carried instructions to German agents operating in this country; but these were not part of her official manifest.

Science News Letter, September 25, 1943

STATISTICS

Average Length of Life Increases for Wage Earners

► THE AVERAGE length of life for American wage-earners increased by nine months during the first year of the war, reaching in 1942 the all-time high of 64.18 years, Metropolitan Life Insurance Company statisticians report on the basis of their industrial policy holders' experience.

Those in the nation who are middle-aged today, the figures further show, will live long enough to take a hand in building the postwar world and to see the many changes likely to come during the next quarter of a century.

"Under present mortality conditions, white men 45 years of age and white women close to 50 still have a quarter of a century of life before them," the statisticians report.

The nine months increase in average length of life of the industrial worker during the first war year was not, of course, the result of the war. This and the gains of preceding years of longevity resulted from "our excellent medical and public health facilities, together with our rising standard of living."

A setback in longevity, the first since 1929, is predicted for the current year. Decrease in the supply of nurses and doctors for civilians, inability of public health services to expand as in the past, unsatisfactory living conditions around many centers of war industry, tightened living conditions for civilians and the mounting losses in the armed forces are expected to show up unfavorably in the mortality and longevity statistics at the close of 1943.

Science News Letter, September 25, 1943

GENERAL SCIENCE

Wool Fiber Cells Differ Greatly in Structure

► CELLS in the outer layer of wool fibers have been found in National Bureau of Standards research to differ greatly in structure from those in the center. The fibrous structure of the cells of the cortex, which is the inner portion of the fiber, can be resolved into still finer microfibrils. The cuticle, or outside of the fiber, shows little or no internal organization.

This difference between the fibrous structure of the cortex and the formless structure of the cuticle may account for the fact that the two layers behave quite differently when the fiber is immersed in reagents such as dyes or swelling media.

Confirmation that this is the real explanation is found in the fact that the various parts of the wool fiber differ only slightly in chemical composition. So far as is known, both the cuticle and the cortex are largely keratin, a protein made up of long chain-like molecules connected by cross-links.

This discovery, which may be of fundamental importance in interpreting many of the properties of wool fiber, was conducted by Dr. Charles W. Hock and Howard F. McMurdie of the National Bureau of Standards. They used an electron microscope, which resolves details of the order of magnitude of only one six-millionth of an inch.

Science News Letter, September 25, 1943

POPULATION

2,000,000 Extra Babies Born Within Ten Years

► A DIVIDEND for the United States of 2,000,000 babies in 10 years is announced by statisticians of the Metropolitan Life Insurance Company in New York. In other words, by the end of 1943 according to their calculations, close to 2,000,000 more babies will have been born in this nation since 1933 than would have been born if the 1933 birth rate had prevailed.

The nation's birth rate, they point out, yielded this extra "without the propaganda and pressure which have characterized the intensive campaigns of the Axis countries for more babies.

"The greater fertility," they conclude, "has been the voluntary expression of a free people who have faith in the future of their country."

Science News Letter, September 25, 1943

ASTRONOMY

Planets Back in Sky

October evenings find Mars and Saturn, which have been absent from the evening sky, visible in the northeast. Venus has become a morning star.

By JAMES STOKLEY

► THE ABSENCE of planets from the evening sky, which came after Venus, so brilliant during the early summer, switched over to be a morning star, has not continued very long. October evenings find Mars and Saturn visible in the northeast. Their positions are shown on the accompanying maps, which depict the appearance of the heavens at 11:00 p.m., war time, on Oct. 1, and an hour earlier at the middle of the month.

Near the horizon, a little north of the east point, is Aldebaran, the red star which marks the eye of Taurus, the bull. A little higher, and father north, is Capella, in Auriga, the charioteer. Mars is just to the right of the star at the boundary between these two constellations, while Saturn is below. Mars, red in color like Aldebaran, is the brighter of the two planets, but both are so low in the sky that the absorption of their light by the atmosphere dims them appreciably. Later in the night, as they climb into the southern sky, they are seen with their full brightness.

First Magnitude

Among the stars, Capella and Aldebaran both belong to the astronomer's first magnitude. Some other stars of this same class can be seen in another direction. High in the west is Cygnus, the swan, otherwise known as the northern cross. If you look for the cross-shaped figure, the star Deneb is easy to locate, since it is at the head of the cross. Below Cygnus is Lyra, the lyre, and in this is Vega. About as high as Vega, but more to the south, is Altair, in Aquila, the eagle. The sixth, and last of our first magnitude stars that appear on these maps is directly south—Fomalhaut, in Piscis Austrinus. Just above it is Aquarius, the water carrier. This figure is closely connected with Piscis Austrinus, which means "the southern fish." On the old star maps, Aquarius was shown as an old man, pouring water from a jar—and the stream of water

was flowing into the fish's mouth!

Two, and possibly three, other planets may be seen this month if you get up early enough in the morning. On Oct. 10, Mercury is at greatest western elongation, which means that it rises about an hour and a half before sunrise. This, however, is not as far ahead of the sun as it rises on some occasions, and so it will be rather difficult to locate the planet in the dawn. Venus, however, is easily seen before sunrise in the east, and it is so bright that it will be possible to follow it without much trouble even after the sun has risen. On Oct. 13, it reaches the magnitude of minus 4.3, which is far brighter than any other planet can ever get, and also more brilliant than any star.

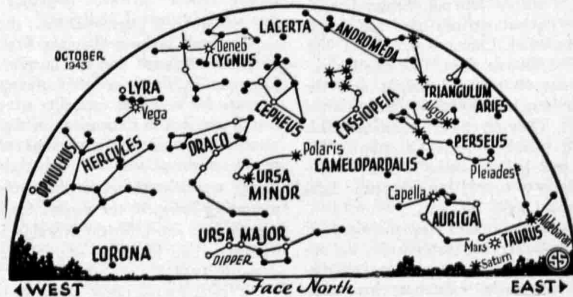
Jupiter rises about 1:00 a.m., and its magnitude is minus 1.7, also very brilliant, though inferior to Venus. On the morning of Oct. 23 there is an occultation, or "eclipse" of Jupiter by the moon, though it is over before moonrise in most of the United States. In New England and the maritime provinces, however, the planet will emerge from behind the moon after it has risen, at about 1:45 a.m. EWT. The moon will be in a gibbous phase, between last quarter and new. Jupiter, therefore, will make its appearance from behind the dark limb of the moon.

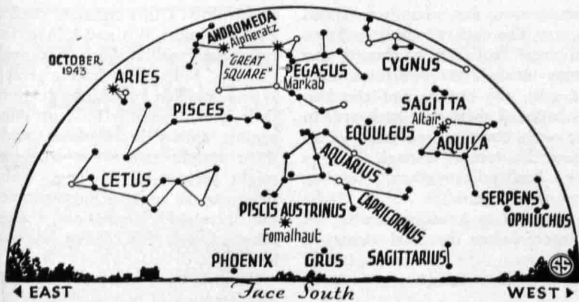
With Mars now joining the objects that we can see during the evening we have a chance to watch it as it makes one of its regular visits to the earth. The distance between us and that planet

changes considerably. We are about 92,900,000 miles away from the sun, while Mars is 141,500,000 miles from it. Though the earth encircles the sun once every 365.25 days, Mars requires 687 days to go around. Every 780 days (nearly 2 years 2 months) we catch up to Mars, and both planets are in the same direction from the sun. Then the distance between Mars and us is equal to the difference of the distances of the two planets from the sun. But after half of the 780-day period, the planets are on opposite sides of the sun, and then Mars is distant from the earth by a figure which is the sum of the distances. Accordingly, the distance of Mars and earth varies tremendously, the more so since the orbit of Mars is not exactly circular.

When we have the closest possible opposition (the name the astronomer gives to the time that both planets are in the same direction from the sun) the distance between is about 34,600,000 miles, and this occurred last in 1924. Another opposition is now approaching, and while this is not an unusually favorable one, as concerns distances, neither is it a very unfavorable one either. In fact, it is about average.

At the beginning of 1943 Mars was far beyond the sun. On Jan. 1 its distance was 215,960,000 miles. Since then it has been drawing closer—and getting brighter. On the 15th of this month it will be about 63,597,000 miles from us. On Nov. 28 it will make its closest approach, when 50,120,000 miles will separate us. So during this month and next, as you watch the red planet come into better view in the evening sky, you can recall that the planet is making us one of its regular neighbors.





★ * ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

Celestial Time Table for October

Oct.	EWT	PHENOMENON
6	3:37 a.m.	Minimum of Algol*.
7	4:10 p.m.	Moon in first quarter.
8	12:25 a.m.	Minimum of Algol.
9	3:00 a.m.	Mercury farthest west of sun.
10	2:00 p.m.	Moon nearest; distance 226,900 miles.
11	9:14 p.m.	Minimum of Algol.
12	12:00 p.m.	Venus at greatest brilliance.
13	9:23 a.m.	Full moon.
14	6:03 p.m.	Minimum of Algol.
15	11:41 p.m.	Moon passes Mars.
17	9:42 a.m.	Moon passes Saturn.
20	9:42 p.m.	Moon in last quarter.

22	9:00 a.m.	Moon farthest; distance 251,300 miles.
23	3:01 a.m.	Moon passes Jupiter (Occultation seen from northeastern part of U. S.).
24	10:50 p.m.	Moon passes Venus.
28	9:59 p.m.	New moon.
29	2:07 a.m.	Minimum of Algol.
31	10:56 p.m.	Minimum of Algol.

*Algol is a well-known variable star which can be located on the maps, in the constellation of Perseus. These are the times of minimum brightness which occur in night-time hours.

Subtract one hour for CWT, two hours for MWT, and three for PWT.

Science News Letter, September 25, 1943

PSYCHOLOGY

Tell Public the Truth

Arguments that gruesome battle pictures should be released or suppressed because of effects on the public may both be wrong.

► SHOULD combat films be censored, before they are shown to the American public, to cut out the gruesome and heart-tearing pictures of American soldiers falling to the ground, wounded or dead?

In the arguments centered around this question, one important factor appears to have been overlooked. That is, that the American public has a right to the truth, be it ever so painful to face. In a democracy, the hardships and the pain belong to the people just as truly as the fruits of victory.

Psychologists would agree, certainly, that pictures of killed and wounded American soldiers would be terribly depressing to the American people. Every mother of a soldier would see in the pathetic figures, the lifeless hands of the American fallen, the form of her own boy. They will make her weep.

Psychologists would also agree with those who argue that release of these pictures would tend to make the audi-

ence more willing to pay taxes, to buy bonds, to give blood.

But those who have made a study of the psychology of the American people are likely to question whether the decision to release or suppress the pictures should be made on either of these grounds.

In a democracy, the war is a war of all the people, not just of those in uniform who have reached the combat areas. Do they not have the right to know what war is like? And isn't a false idea given by pictures of a landing, an advance, a victory from which have been censored all views of wounded and killed? Is it intended that the people should believe that victories are to be won without cost?

Of course, they won't believe any such nonsense. But they are very likely to feel that the censor, in cutting part of the truth from the films because the truth is unpleasant, is depriving them of knowledge they need for an intelli-

gent understanding of what is going on. They may feel that they are being treated as children, to be shielded from "the facts of life." They may even feel, unfortunately, that their leaders do not trust them, that important facts are being withheld, that affairs are much worse than has been reported.

Later release of the pictures for the purpose of stimulating interest in a war bond drive or to cure the alleged "complacency" of the people would not necessarily erase the effect of the previous suppression. In fact, it might very well add to it.

In other words, the people are likely to feel that the truth should be told just because it is the truth, not for the effect it will have on the public.

Another aspect of the situation that has not been discussed is the effect on soldiers of the showing of combat pictures minus the American killed and wounded.

Evidence collected by psychologists indicates that such censorship might deprive the soldier who is later to go into combat of a mental preparation for the shock. Nothing is so frightening to the human mind as a sudden meeting with the unexpected. Before men go into combat, it is a distinct advantage for them to be prepared for what they will see and hear. One of the hardest things for a soldier to bear is to see his friends—other American soldiers—wounded and crying for help. He wants to stop and give first aid even though he can be of greatest help to the wounded man only by pushing on and repelling the enemy. Complete battle films showing the wounded and what is done to pro-

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teach them by advancing troops will teach him what he must face. They will shock him, yes. But it will be a sort of vaccination against the greater shock of real combat. Norwegian physicians report that the Germans showed their horror pictures of war in Norway before the invasion in the hope of demoralizing the people. They had the opposite effect. In communities where the films were shown, the people stood up under the crushing blow of invasion much better than the people who had not had

this preparation for what was ahead.

In a way, this does not apply to American civilians. It is to be hoped that they may never have actual personal contact with the enemy and the horrors of battle in their own backyard. In another way, however, every one of us does have this contact through the ones we love—husband, sweetheart, brother, the boy next door.

We all need to know just what we must expect before the final victory is won.

Science News Letter, September 25, 1943

PSYCHIATRY

Mental Borderlands

Six million Americans suffer from illnesses in "Borderlands of Psychiatry," a field for neither mental specialists nor doctors of physical diseases.

► SIX MILLION AMERICANS are suffering from illnesses that are not exactly mental diseases and yet are not wholly physical—they are in a sort of no-man's-land called "Borderlands of Psychiatry."

This is an estimate by Dr. Stanley Cobb, of Harvard Medical School and psychiatrist in chief of Massachusetts General Hospital. It is he who has named this field of medicine "borderlands" because it is a frontier territory of modern medicine; much of it is claimed by neurologists, general medical practitioners, psychologists and even teachers and preachers, but much of it is disclaimed by any or all of them.

The army of sufferers in the border-

lands includes: epilepsy, 650,000; other neurological ills, 600,000; stammering 1,200,000; psychoneurosis, 2,500,000 and those who "can neither get along with liquor nor get along without it," 1,600,000.

What might be called a guide to the borderlands is provided by Dr. Cobb in a new book, *Borderlands of Psychiatry*, just published by the Harvard University Press. Of particular interest now is the section on war neurosis, an illness that may be expected to add to the two and a half million already estimated to be suffering from neuroses.

The first World War, Dr. Cobb explains, shattered the notion that patients with a neurosis are "weak" and "ought to snap out of it if they only had the guts."

"In the first place," he said, "these symptoms often appeared in men who were considered brave and strong; excellent officers were often affected. The moralistic attitude was manifestly nonsensical."

Heredity, Dr. Cobb concludes, probably plays a part only in that some men are born with more sensitive nervous systems than others. But "if the strain imposed on the soldier is severe enough, an average, sound person can break . . . of course, because of past experiences and individual conditioning, what is strain to one man is not strain to another, or at least in the same degree.

"The main common denominator is the internal conflict of the soldier between the instinct of self-preservation and the social urge to 'carry on': fear

versus duty. Other common conflicts are with discipline, dirt and killing. In some individuals with much 'repressed aggression,' killing may lead to great anxiety and complete invalidism. It seems that their whole carefully built up education against cruelty broke down and gave them insight into what cruelties they might perform if let loose. This they recognize as entirely incompatible with the personal integration they have achieved, and the conflict becomes unbearable."

Fatigue, poor diet, sleeplessness and illness may lead to a state of exhaustion that predisposes to mental ills, Dr. Cobb points out. He lists the main sources of strain for the soldier as danger of death, guilt over killing, responsibility, separation from family and sexual deprivation. It has been found, he said, that the type of man most likely to break down is the unsociable fellow who is self-centered and overconscientious.

Prevention includes keeping the nervously unfit out of the armed forces, providing in army routine for proper periods of rest and recreation and shortening the periods of tension whenever possible. Early adequate treatment is essential.

But although it is wrong to let psychoneurotics into the Army in the mistaken idea that "the Army will do them good," Dr. Cobb points out, it is also a mistake to say that "no neurotics are wanted in the Army." If such a blanket order were given, many useful men might be excluded.

"Ruling out the 'nervous' men might take out some of those who give elan to the group," Dr. Cobb said. "Their quick reactions might be invaluable in scouting or even essential for some types of individual combat. . . . In civil life it is certain that elimination of all neurotic persons would cause inestimable loss to art, science and the professions."

Science News Letter, September 25, 1943

INVENTION

Novel Bath Tub Doubles As Mattress Cover

► A CONVERTIBLE bathing apparatus, invented recently, is designed particularly for bedridden patients, and provides a shallow open tank the size of a bed mattress. It is made of rubber. When not in use as a bathing tank the sides are folded down over the edges of the mattress forming, with the bottom of the tank, a protective covering for the mattress. It is patent No. 2,329,326 to Maxwell H. Bloomberg.

Science News Letter, September 25, 1943

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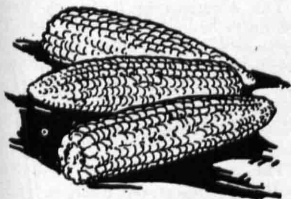
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NUTRITION

NATURE RAMBLINGS

by Frank Thone



We Don't Like It!

▶ ISN'T IT ODD, how whole peoples behave like individual obstreperous children when suddenly confronted with an unaccustomed food!

Those who can remember the first World War will doubtless recall their annoyance at hearing that the starving Belgians refused to eat corn when it was offered to them by Herbert Hoover's famine relief commission. The difficulty lay partly in the fact that they did not know how to make cornbread and other corn foods, but to a very large extent it was sheer balky unwillingness to adopt and get used to something they had never eaten before.

Corn was something they had been accustomed to importing and feeding to cattle: therefore it wasn't fit for human beings to eat. And that was that. So we Americans gave up some of our wheat and ate the corn ourselves, though we grumbled at the Belgians for their stubbornness even while we munched our johnnycake.

Now we are showing signs of putting up a very similar performance ourselves. We've had to give up a good deal of our meat, especially beef, so that fighting men may have it. To keep proteins in our national diet up to a good working level, we are offered supplements of soybean products to "stretch" the meat we have left.

And we don't like it. We wrinkle our collective nose, pound on the table with our national knife-handle, and yell for beefsteak. Some of the clamor, to be sure, is synthetic. Part of the outcry comes from cattle-raising sections, and can therefore hardly be called disinterested. More of it comes from political "outs" who hope to become "ins" at the next election, and is therefore simply

dishonest. But even interested and self-seeking parties would not be raising a row if they didn't think there was a fairly solid body of national discontent to capitalize for their own purposes.

As a matter of historic fact, we have changed our national food habits radically since the days when the Republic was young. The "groaning board" about which writers enthused a century or so ago would make us groan ourselves if we were confronted with it now. It was loaded to the limit with meat, fowl, fish, usually highly spiced, smoked or pickled;

there were plenty of breads of various kinds, as well as starchy vegetables, but not a great deal in the way of green ones. Salads were rare or lacking, and fresh fruits, except for a few locally raised products, were rarer still.

In short, our great-grandfathers would have thought our present-day meals anemic; to us an eighteenth- or early nineteenth-century banquet menu looks almost cannibalistic. Which goes to show that national food habits, after all, are not unamendable.

Science News Letter, September 25, 1943

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BOTANY

Plant Tissue Still Lives

This year marks tenth anniversary of first time bit of plant root was kept growing in dish of nutrient separated from the parent plant.

➤ THIS YEAR marks the tenth anniversary of the first permanently successful plant tissue culture—a separated piece of a plant, growing in a dish of nutrient fluid after the manner of the longer-established and better known bit of embryo chick heart started by Dr. Alexis Carrell in 1912.

The first successful long-term plant tissue culture, started in 1933 at the laboratories of the Rockefeller Institute for Medical Research by Dr. Philip R. White, is still growing (See *SNL*, Jan. 6, 1934). It is a bit of the root of a tomato plant, which Dr. White states "shows every evidence of potential immortality." It has "offspring" at four other research laboratories in this country.

At the Rockefeller laboratories, the basic stock of the culture is represented by 25 pieces of root growing each in its individual dish. Every week, the amount of growth that has taken place is measured, and 15 millimeters (about five-eighths inch) is cut off the tip and the rest discarded. This of course is to obviate the accumulation of simply unwieldy masses of root cultures.

Dr. White calculates that if it had been possible to keep the original piece growing, with all its branches, the total length in kilometers would now be represented by a figure 10, followed by 2799 ciphers; that is, 10 to the power 2800, in kilometers. To write that figure out in full, using ordinary typewriter type, single spaced and without margins, would require just about half an ordinary lettersize sheet. What it would be

in astronomical distances is simply beyond human imagination.

The exactly measured weekly growth rates, it has been found, show a curious seasonal fluctuation, with peaks in summer and slumps in winter. What this may mean, in a root that has not been attached to the rest of a plant for 10 years, is not yet explained.

Dr. White's results are presented in the British journal, *Nature* (July 31) which has just reached this country.

Science News Letter, September 25, 1943

MILITARY SCIENCE

Time, Space Great Factors In Global War Strategy

➤ LINES of communication encircling the earth and extending over 56,000 miles become necessary in the present global war.

It is "not merely a war on two fronts, but in several theaters," declares Gen. G. C. Marshall, Army Chief of Staff, in his biennial report to the Secretary of War, covering the two years since July 1, 1941. "Military operations in the Pacific area and the Far-East created unprecedented logistical problems with respect to shipping. Time and space factors dictated our strategy to a considerable degree."

To land and maintain American forces in Australia required more than twice the ship tonnage necessary for similar American forces in Europe and North Africa. The sea route for army transportation from San Francisco to Sydney requires 28 days. The air route by way of

Hawaii and New Caledonia requires less than three days ordinarily, approximately 67 hours. To reach the same Australian port from New York by way of the Cape of Good Hope and the Indian Ocean would require from 70 to 80 days. From San Francisco to Guadalcanal by sea route takes 26 days.

The Aleutians in the north Pacific are much more quickly reached. The sea route to Kiska requires 12 days from Seattle, and to Dutch Harbor about nine days. By way of Alaska, Dutch Harbor may be reached by air in 21 hours and Kiska in an additional six hours.

The route by sea from New York to Basra, Iraq, at the northern end of the Gulf of Persia, was a 70 day trip when it was necessary to round the Cape of Good Hope; now by way of the Mediterranean only 42 days are needed. To Calcutta about the same time is required. Much war equipment and supplies were shipped to Russia and India over the long route before the Mediterranean was cleared.

To Liverpool from New York by ocean convoy some 17 days are ordinarily consumed. To Casablanca from the same American port one additional day is needed. Mediterranean ports are reached by way of Gibraltar in 20 to 24 days.

By air England is reached in 20 hours from New York. Flying to Accra, Africa, by way of Cairo requires 56 hours. From there to Cairo takes an additional 38 hours, and another additional 25 hours to get to Kunming, China, the eastern end of the Burma Road.

Science News Letter, September 25, 1943

Ventilation under buildings helps prevent decay of wood floors and floor beams.

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New Machines and Gadgets

DOUBLE PROPELLERS which rotate in opposite directions around the same axis are aiding the development of more powerful airplane engines.

Science News Letter, September 25, 1943

ADZ ATTACHMENTS for hammers convert them into cutting tools to dress off lumber. The device is quickly installed over the claw of the hammer and held firmly in place by a wedge lug between the claw and a strap which passes over the handle.

Science News Letter, September 25, 1943

TRAFFIC CONTROL semaphores, recently patented, include elevated stands for policemen directing traffic. When not in use, they sink into excavations in the streets, presenting no obstruction to traffic. Counter-weights help raise and lower the apparatus.

Science News Letter, September 25, 1943

MOBILE, ELECTRICAL air-conditioners, mounted on wheels and weighing about 600 pounds each, are being manufactured for the armed services. They cool and dehumidify the air inside aircraft undergoing field repairs in tropical heat and condition air in rooms where special work demands ordinary humidity and temperatures.

Science News Letter, September 25, 1943

PAPER CONTAINERS in quart and gallon sizes are used by one paint manufacturer instead of metal cans. The side walls are made of several layers of spirally wound paper strips firmly glued together. These paper paint cans are

claimed to be unbreakable and leakproof.

Science News Letter, September 25, 1943

OLD ANTI-FREEZE mixtures are given a new lease on life by a chemical preparation which neutralizes any acid that has formed and prevents rust formation in the engine.

Science News Letter, September 25, 1943

CLEANING HATS at home is simplified by a hollow, adjustable hat holder made of either metal or plastic. To clean the under side of the brim, the hat is placed inside the holder; to clean the top, it is placed outside.

Science News Letter, September 25, 1943

HEAVY TRUCK and tractor tires stuck to rims are easily removed with a new type of tool. By a system of hooks and leverage the bead is forced loose in a few minutes. This bead-loosener was developed from a similar tool used to remove airplane tires vulcanized to rims by heat generated in landing.

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 175.

STRATOSPHERICS

Stratosphere Illnesses Found Not Permanent

► ILLNESSES induced by extremely high altitudes are not permanent, and only rarely are they serious, is the good news that was brought to parents and friends of stratosphere flyers by Dr. Martin G. Larrabee of the University of Pennsylvania Medical School, speaking in Science Service's Adventures in Science program over the Columbia Broadcasting System.

"Relief is almost immediate as soon as the man is returned to normal conditions," stated Dr. Larrabee, who is doing important medical research in stratosphere flying.

The modern stratosphere chamber, which is hermetically sealed from the outside, reduces the air pressure and temperature at about the same rate as a fast plane climbing into the sky, explained John G. Bergdoll, Jr., chief engineer of the York Corporation, when interviewed during the same program. The York Corporation, credited with developing the modern stratosphere chamber which tests men and materials for altitude endurance, was responsible for engineering and installing the first

one in Canada in 1939. Since then 30 have been built in the United States for use in aircraft plants, universities and government laboratories.

The modern strato-chamber is a steel cylinder 22 feet long which resembles a submarine both inside and out. Within five minutes the temperature can be made to fall from 70 degrees above zero Fahrenheit to 70 degrees below—a drop of 140 degrees—Mr. Bergdoll pointed out. Without even leaving the ground, the person within the chamber can experience all the sensations of both temperature and pressure which a stratosphere pilot must endure. The safe ceiling of human endurance is 38,000 feet, a little over seven miles.

"Stratosphere flying has touched off a life-and-death race between artillery and aircraft to see which can go the higher," said Dr. Larrabee. An altitude of 35,000 feet, which earlier in the war was considered a safe level for bombers, according to the British can now be reached by the latest German anti-aircraft guns. This means that flight ceilings must continually be pushed higher and higher, he explained, but the problem is less one of machines than of human endurance.

Science News Letter, September 25, 1943

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First Glances at New Books

► LIFE in all its manifestations is passed in review, through vivid word and striking picture, in Carroll Lane Fenton's *OUR LIVING WORLD* (*Doubleday, Doran*, \$4.50). The aspects of biology which Dr. Fenton presents are familiar enough: origin of life, specialization of parts, nutrition, reproduction, evolution, ecology and all the rest that can be found in a well-organized textbook. But he contrives somehow to instill a seldom-encountered note of drama, which will undoubtedly inspire many of his readers to go forth with new eyes of wonder for familiar things.

Science News Letter, September 25, 1943

► BEES AND HONEY are unfailing arousers of interest and appetite, so that another good book on the subject can always count on a favorable reception. In *BEEKEEPING FOR PROFIT AND PLEASURE*, Addison Webb has provided just about what the average beginning apiarist wants: instructions that are adequate but not too complex, made plain with plenty of simple but correct illustrations. (*Macmillan*, \$2.)

Science News Letter, September 25, 1943

► NEWCOMER to the yearly review volumes in various fields of science is *VITAMINS AND HORMONES*, edited by Robert S. Harris and Kenneth V. Thimann (*Academic Press*, \$6.50). Research in these fields is so extensive and the literature so voluminous that many scientists will undoubtedly welcome yearly review volumes to keep them abreast of current developments.

Science News Letter, September 25, 1943

► COPPER CAMP, a somewhat belated publication on the WPA Writers' Program, is a vividly written account of the brave and brawling past of the city of Butte, Mont. It is historical sociology in the raw, with a certain amount of mineralogy, mining and metallurgy thrown in for good measure. There must have been a good deal of rummaging of old pigeonholes and drawers to find the photographs used in the illustrations. (*Hastings House*, \$2.75.)

Science News Letter, September 25, 1943

► OF SOLID VALUE as a reference book for professional workers in horticulture, mycology, bacteriology, helminthology and entomology, is *DISEASES AND PESTS OF ORNAMENTAL PLANTS*, by

B. O. Dodge and H. W. Rickett. Contents are arranged according to host species. There are numerous good photographic plates. (*Jacques Cattell*, \$6.50)

Science News Letter, September 25, 1943

► A NEWSMAN who has spent much time in India, tells how *INDIA'S PROBLEM CAN BE SOLVED* in a book by that title. The author, De Witt Mackenzie, tells about the social, economic and political conditions in this much discussed country. (*Doubleday-Doran*, \$3.)

Science News Letter, September 25, 1943

► THE WEATHER and its effects on health and feelings, ever-interesting topics of conversation, has long been a matter of scientific study by Dr. William F. Peterson. In *LINCOLN-DOUGLAS: The Weather As Destiny* (*Thomas*, \$3), he tells how he thinks weather affects the human body, emotions and actions, using for illustration the relation between weather and significant events and acts in the lives of two great Americans. His conclusion is that not even the great can escape these effects.

Science News Letter, September 25, 1943

Just Off the Press

THE ARMY OFFICER'S MANUAL—A. C. M. Azoy—*Appleton*, 396 p., illus., \$2.50, third ed. rev.

BIOLOGICAL RESULTS OF THE LAST CRUISE OF THE CARNEGIE—Herbert W. Graham and others—*Carnegie Institution*, 92 p., illus., \$1 paper, \$1.50 cloth, Biology IV, Publication No. 555.

CHEMISTRY AND THE AEROPLANE—Vernon J. Clancey—*Ronald*, 176 p., illus., \$2.25.

DENTAL VOCABULARY: English-Spanish—Spanish-English: Including Many Medical Terms—Joseph S. F. Marie—*Jacques Cattell*, 150 p., illus., \$4.

DIRECTORY OF NEW ENGLAND MANUFACTURERS—New England Council—*Georgie D. Hall Co.*, 740 p., illus., \$25. 8th annual ed.

FOGS, CLOUDS AND AVIATION—W. J. Humphreys—*Williams and Wilkins*, 200 p., illus., \$3.

FOOD FROM THE SEA: Fish and Shellfish of New England—Rachel L. Carlson—*Govt Printing Office*, 74 p., illus., 15c, Conservation Bulletin 33.

ISLAND PEOPLES OF THE WESTERN PACIFIC MICRONESIA AND MELANESIA—Herbert W. Kreiger—*Smithsonian*, 104 p., illus., limited editions; free upon direct application.

LOUISIANA FOREST RESOURCES AND INDUSTRIES—R. K. Winters, G. B. Ward, Jr., and I. F. Eldredge—*Govt Printing Office*, 44 p., illus., 25c.

MACHINES FOR AMERICA—Marshall Dunn and Lloyd N. Morrisett—*World Book Co.*, 164 p., illus., 80c.

METEOROLOGICAL RESULTS OF CRUISE VII OF THE CARNEGIE, 1928-1929—Woodrow C. Jacobs, Katherine B. Clarke—*Carnegie Institution*, 168 p., illus., \$1.50 paper, \$2 cloth, Publication No. 544.

MINERALS: Their Identification, Uses, and How to Collect Them—Herbert S. Zim and Elizabeth K. Cooper—*Harcourt, Brace*, 368 p., illus., \$3.

POISONOUS SNAKES, PLANTS AND BLACK WIDOW SPIDER OF LOUISIANA—James Nelson Gowanloch and Clair A. Brown—*Louisiana Department of Conservation*, 133 p., illus., free, limited copies.

POWER FOR AMERICA—Marshall Dunn and

Lloyd N. Morrisett—*World Book Co.*, 164 p., illus., 80c.

SILK RAISING IN COLONIAL MEXICO—Woodrow Borah—*Univ. of Calif.*, 169 p., illus., \$2.

SIMPLIFIED PHYSICS: A Clear Explanation of Modern Science with Easily Made Apparatus and Many Simple Experiments—Sidney Aylmer Small and Charles Ramsey Clark—*Dutton*, 428 p., illus., \$3.

START TODAY: Your Guide to Physical Fitness—C. Ward Crampton—*Barnes*, 224 p., illus., \$1.75.

UPPER WIND OBSERVATIONS AND RESULTS OBTAINED ON CRUISE VII OF THE CARNEGIE—Andrew Thomson—*Carnegie Institution*, 93 p., illus., 75c paper, \$1 cloth, Publication No. 547.

VITALIZED PHYSICS IN GRAPHICOLOR—Robert H. Carleton—*College Entrance Book Co.*, 378 p., illus., 50c.

WINGS FOR AMERICA—Marshall Dunn and Lloyd N. Morrisett—*World Book Co.*, 244 p., illus., \$1.

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