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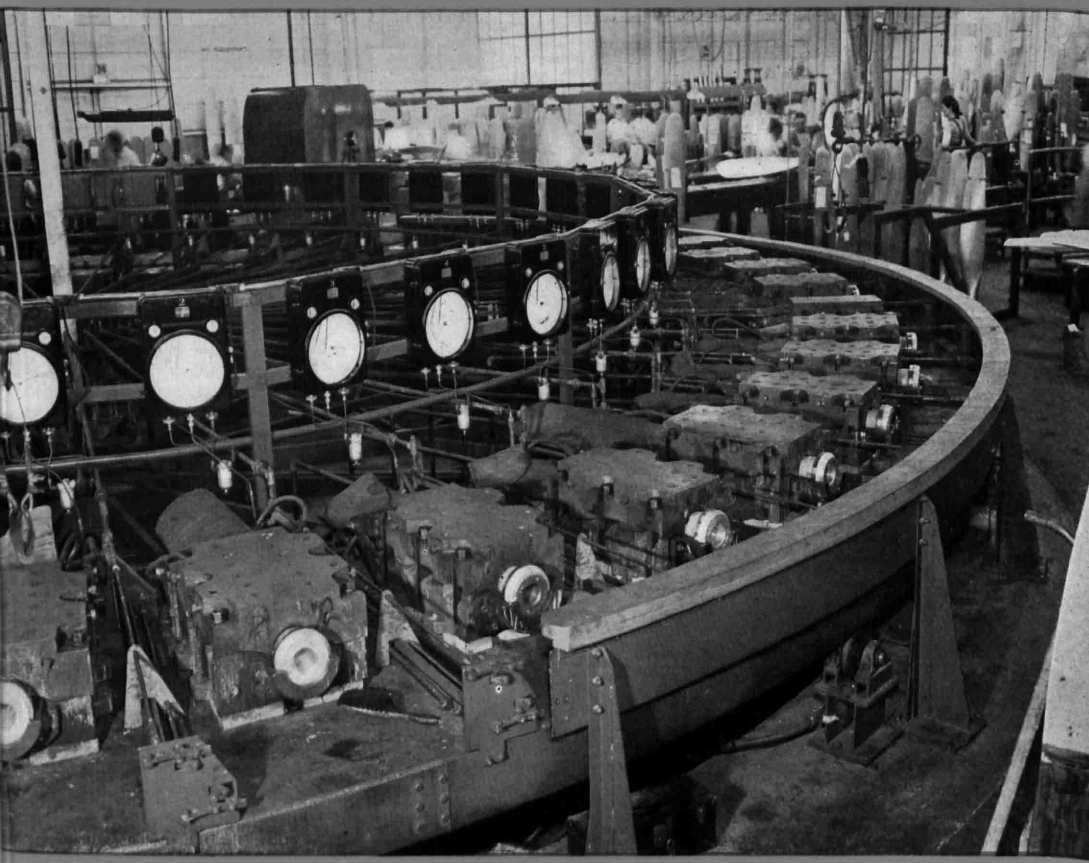
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • SEPTEMBER 18, 1943



Turning Out Propellers

See Page 179

A SCIENCE SERVICE PUBLICATION

Do You Know?

Sweden is reported to be rapidly increasing its use of *water-power* because of the shortage of imported coal and other fuel.

Mercury to meet 20% of the needs of the United Nations is now produced in western Canada; prior to the war Canada produced no mercury.

Giant *lawnmowers* for Army airfields are being constructed, each of which will cut a swath 21 feet wide at a 20-mile speed, clearing 40 acres an hour.

Mexico has produced some 5,500,000,000 ounces of *silver* in 400 years since Cortez landed in that country, and is now producing about 80,000,000 ounces a year.

Bureau of Census *life tables* show that the average lifetime of rural people is longer than that of urbanites, women longer than men, and whites longer than non-whites.

"Pig cards" must be held by all Belgian owners of one or more *pigs*; on them up-to-date records must be kept, including births, deaths, slaughterings and sales, for the benefit of the Nazi occupants.

About 1,350,000,000 pounds of farmers' stock *peanuts* of the 1942 crop were cleaned and shelled to meet the demands of peanut-butter makers and other users; this is nearly 50% more than cleaned and shelled the previous year.

Question Box

Page numbers of Questions discussed in this issue:

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.*

Mexico, Jamaica and the Bahama Islands have furnished over 57,000 farm *workers* to the United States this season.

Walkie-talkie one-man radio stations made for army scouts are now used on shipboard for communication with nearby boats; their range is about 10 miles.

Chicle for America's *chewing gum* is obtained from Mexico and Guatemala.

Approximately one-third of the *gasoline* produced in refineries east of the Rocky mountains during the present half-year is destined for military uses.

SCIENCE NEWS LETTER

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MEDICINE

New Syphilis Treatment

Chemical from lemon peel may make the fast treatment of syphilis safer and more effective as it protects the brain blood vessels from damage by arsenical drug.

➤ A CHEMICAL from lemon peel may make the fast treatment of syphilis safer and more effective, it appears from experiments reported by Dr. David H. Goldstein, Dr. Abraham Stolman and Dr. Arthur E. Goldfarb, of New York University College of Medicine and Bellevue Hospital in *Science* (Sept. 10).

When syphilis treatment is reduced to days instead of months or years, very large doses of arsenicals must be given which not all patients can stand. The most serious poisonous effect is brain damage which occurs in a little more than one out of every hundred patients treated with mapharsen and kills about three in every 1000, the New York investigators point out. Mapharsen is the arsenic drug chiefly used.

Symptoms range from headache and dizziness to convulsions and death. The commonest finding in the injured brain is damage to the capillaries, the tiny blood vessels which connect artery endings with vein endings. This, the scientists point out, suggests that the fast syphilis treatment, when it causes damage, does so by making the walls of the capillaries more permeable.

Vitamin P from lemon juice is supposed to prevent capillary permeability. Following this lead, lemon juice was tried to offset the capillary injury done by mapharsen. It was not too effective. Meanwhile other scientists had isolated a chemical from lemon peel which appeared to decrease fragility of the capillaries. This chemical is a chalcone, belonging to a group of natural yellow and orange coloring matters.

The New York investigators used a methyl chalcone developed by the Research Department of the California Fruit Growers Exchange. When they gave this to rabbits along with mapharsen, 90% of the animals survived, whereas only 57% survived the same doses of mapharsen alone.

The chalcone, they found, did not lessen the ability of mapharsen to kill the syphilis spirochetes. Test tube experiments show that the chalcone itself may have some killing effect on the spirochetes.

Science News Letter, September 18, 1943

CHEMISTRY

Heat for Making Steel

If steel is heated to 1700 degrees Fahrenheit, then suddenly quenched in a solution of either caustic potash or caustic soda, the metal can easily be cold-rolled.

➤ STEEL for war, with many of the properties of expensive alloy steels, can be made without the necessity of adding such hard-to-get elements as chromium and vanadium, Dr. Merle Randall of the University of California told members of the American Chemical Society. It is made by a special heat treatment of ordinary low-carbon steel.

The process, which was originated by Dr. Randall's colleague, George F. Nelson of Berkeley, Calif., consists in heating the steel very hot—up to 1700 degrees Fahrenheit, and then suddenly quenching it in a 35% solution of either caustic potash or caustic soda. The metal can then be cold-rolled into sheets or bars without difficulty. Tests show it to posssess an extraordinarily high strength.

Science News Letter, September 18, 1943

TNT Produced Cheaper

➤ SIMPLER, cheaper production of TNT war explosive is promised by an improvement in the first production step. The new process was reported to the American Chemical Society meeting in Pittsburgh by Dr. Donald F. Othmer and Hugo L. Kleinhans, Jr., of the Polytechnic Institute of Brooklyn.

Nitric acid is pumped into a special still, thus adding one nitric acid molecule to one toluene molecule by a simple distillation process. Pure mononitrotoluene is drawn off at the bottom to be further nitrated into TNT, and water formed during the reaction is removed from the top.

The procedure eliminates the use of sulfuric acid and simplifies the more cumbersome and expensive batch method now in use.

Science News Letter, September 18, 1943

Molds Help Make Alcohol

➤ BRAN is usually looked upon as low-value stuff; moldy bran would ordinarily be considered quite worthless. Yet nowadays industrial chemists are deliberately making bran moldy, and getting out of the mold a substance that splits starch down into sugar for fermentation into alcohol, used for a thousand war purposes all the way from smokeless powder to synthetic rubber.

CURED — The airplane propeller blade being unloaded here has been subjected to a four-hour treatment in the merry-go-round machine shown on the cover of this week's SCIENCE NEWS LETTER. As shown on the cover, the blades at Hamilton Standard Propellers division of United Aircraft Corporation progress clockwise through a cooling cycle to an unloading station at the extreme left.

New methods for producing and processing these suddenly valuable molds were described before the meeting by J. Ziffer, M. Rosenblatt and A. J. Liebmann of the Schenley Research Institute, Inc., at Lawrenceburg, Ind. They stated that they can get full growths of them in from 36 to 48 hours, and have them dried and ready for processing in about an equal additional time-period.

Science News Letter, September 18, 1943

CHEMISTRY

Molecules Cause Wrinkles

Excessive wrinkling of synthetic fabrics can be overcome by rearranging the molecules so as to secure a compromise between strength and resiliency needed.

➤ EXCESSIVE wrinkling of synthetic fabrics may be overcome by rearranging the molecules, Dr. Herman Mark, professor at Polytechnic Institute of Brooklyn, and Jack Press, an undergraduate student, reported to the American Chemical Society.

Compromise will be needed between the present rigid organization of molecules to give great strength and a flexible, random arrangement which produces resiliency.

Basic research has been laying the foundation for a process of making synthetic fabrics so that wrinkles will "hang out" in the closet in the same way as wrinkled wool garments.

Although a final view has not been reached, the scientists point out that the "molecules should be arranged in the fiber randomly and in such a way that they maintain a certain degree of mobility. It seems therefore that the requirements for maximum strength and optimum resilience are conflicting and that one has to arrive at a compromise in the construction of a fiber in order to combine these two outstanding properties."

Science News Letter, September 18, 1943

Starch Acetate for Lacquer

➤ THAT STORY BOOK car you are going to get after the war may have something new added to its duralumin frame, molded plastic body and flexible, non-scratch windows. The lacquer that will gleam on its sleek sides may be made out of potatoes.

The new product of the laboratory, which has yet to make its large-scale debut through factory doors, is starch acetate, a chemical relative of the cellulose acetate made from cotton and wood pulp and already responsible for a whole family of industrial giants, including rayon, wrapping films, plastics and much of the lacquer now used on cars, furniture, etc.

Starch acetate was described before the meeting by two U. S. Department of Agriculture research workers, Dr. Lee T. Smith and Dr. R. H. Treadway of the staff of the Eastern Regional Research Laboratory at Philadelphia.

Starch acetate can be made by either of two processes. In one, potato starch is treated directly with acetic acid, in the presence of a stronger acid such as sulfuric to help the job along. In the other, the starch grains are put through a pre-swelling stage in formic acid, and the acetic acid is then added. The second process is much the quicker, requiring only an hour's cooking just short of the boiling point, as compared with nine hours when the unmodified starch is used.

The new compound will probably not serve for solid plastics or for wrapping films, because it is brittle. But Drs. Smith and Treadway state that it "appears promising applied as lacquers to wood, paper and other fibrous materials and used as water-resistant adhesives, cements and binders."

Science News Letter, September 18, 1943

Radio Waves Cook Plastics

➤ HEATING plastic objects all the way through at the same time, by the same radio-wave treatment used in producing artificial fever in modern medicine, is the newest dodge in speeding up the production of airplane instrument panels and steering wheels, radio housings and knobs, and all the ten thousand other plastic gadgets used in present-day war equipment. It has been given the convenience-name of "heatronic

WHY CLOTHES WRINKLE—These models show the arrangement of the molecules in two types of nylon. The one on the left illustrates the molecular arrangement in undrawn nylon; that on the right, that of drawn nylon with great strength. The models are held by Mrs. Illy Valyi, of the academic staff of the Polytechnic Institute of Brooklyn.

molding," and it was descrbied before the meeting of the American Chemical Society by V. E. Meharg of the Bakelite Corporation.

Use of high-frequency waves to produce heat in metal objects is not new, but it has not been practical until lately, Mr. Meharg told his audience, to heat up non-conductors of electricity in this way. Now that means have been devised to make it work, it is being used to produce a more uniform, even heat throughout plastic objects of the thermo-setting variety, in which one heating forms and hardens the plastic, which will not soften or change for any number of subsequent heatings.

Hitherto it has been the practice to heat the die, which has meant that the heat flowed from the outside inward, and was not uniformly applied throughout the mass at the same time.

Science News Letter, September 18, 1943

CHEMISTRY

Ultrasonic Sound Waves Useful Chemical Tool

➤ ULTRASONIC WAVES, which are sound waves far too high-pitched for any ears to hear, have strange effects on mixtures and solutions, and may some day become a useful chemical tool, Prof. Karl Sollner of the University of Minnesota stated in an address before the meeting of the American Chemical Society in Pittsburgh.

Audible sound waves come at rates of a few hundreds or thousands per second; ultrasonics, which are started by crystals set into rapid pulsation by high-frequency electric currents, have rates up to a million or more per second. Their effects were first studied some years ago by Prof. R. W. Wood of the Johns Hopkins University and Dr. A. L. Loomis, in the latter's private laboratory at Tuxedo Park, N. Y.; since then also by a number of other workers.

The waves have been used to make permanent emulsions of such "unmixable" things as oil and water and even water and mercury. Acting on this hint, one researcher has used them to homogenize milk so that the cream will not separate out. This use has not yet been commercialized. The waves also disperse exceedingly fine metallic particles through a suspending medium; Prof. Sollner suggested their use in this way to produce special, ultra-fine-grained photographic emulsions.

Science News Letter, September 18, 1943

ENGINEERING

Superior Gun Developed

The Army's new submachine gun, M3, found superior to foreign weapons, and, because it is fulfilling "the impossible," will replace all previous types.

➤ THE ARMY'S new submachine gun, M3, is scheduled to supplant all other weapons of this type as a result of its fulfilling "impossible" requirements, Col. Rene R. Studler, chief of the Small Arms Development Branch in the Ordnance Department, states in the journal, *Army Ordnance,* (Sept.-Oct.)

Col. Studler relates how, after testing the experimental gun, which was ready last year, the Infantry reported "that in comparison with standard weapons the new sub-machine gun was more accurate, easier to control, had less recoil, and a slower rate of fire which made each shot more effective.

"The Parachute Troops preferred it because of its lighter weight and collapsible stock. The Amphibious Troops found that rain, salt spray, or even complete immersion in sea water had little effect on its reliability during landing operations.

"The Armored Force reported that even under conditions of excessive dust incident to tank operation in the desert it could be depended on to deliver accurate deadly fire. The Tank Destroyer Command found that its sturdy, all-metal construction stood all the battering that a high-speed motorized gun mount could give it.

"At the climax to this series of tests the Ordnance Department stated that it was superior in all respects to every comparable foreign weapon."

The M3 submachine gun can be produced without complicated machine tools. Most of its parts are made by the metal-stamping process, thus releasing many machine facilities for other war work.

"The savings involved in switching to the exclusive manufacture of the new gun are enormous," Col. Studler declares, "whether viewed from the standpoint of money, man-hours, or machine tools."

Science News Letter, September 18, 1943

CHEMISTRY-NUTRITION

Vitamins from Sugar-Cane

Despite their lack in fully refined sugar, analyses indicate that sugar-cane and its juice are rich in pantothenic acid, and a good source of niacin.

➤ COMMON white sugar is the purest chemical substance that most of us ever get to see; it is nearer absolute chemical purity than most of the laboratory compounds bearing the mark, "C.P." This very purity becomes a handicap for some purposes; one of the complaints sometimes heard against refined sugar is that it supplies energy without accompanying vitamins.

That vitamins are not lacking in the source of sugar is indicated by results of analyses presented before the American Chemical Society by William R. Jackson of the research laboratory of Merck and Company. He worked both on whole cane from Cuba and Louisiana, and on raw sugar-cane juice. His report: "Whole mature sugar cane is a fair source of thiamin and riboflavin, rich in pantothenic acid, and a good source of niacin."

Science News Letter, September 18, 1943

Vegetables Lose Sugars

➤ IF YOU WANT to get all the sugar in some of our common vegetables, you'll have to eat them raw. This would seem to be one conclusion to be drawn from studies of E. Whitman Rice and Louis Lang of the National Sugar Refining Company. They found that although onions, cabbage and carrots contain considerable percentages of sugar, they lose them in various steps involved in preparing them for the table.

Carrots especially "bleed" sugar very freely, the data indicated; "A preliminary experiment with fresh carrots showed that 50% of the total solids were lost when the carrot was subjected to the common steps of precooking (blanching) before dehydrating and reconstituting before the final cooking. Losses in cooking will be additional to these mentioned.

"Further experiments seem to indicate that the losses of valuable food components of vegetables in certain methods of processing warrant a re-evaluation of some products. This is especially true during the present food shortage."

Science News Letter, September 18, 1943

Clay Used to Save Proteins

➤ QUICKER and cheaper removal of proteins from watery distillery wastes is promised by a new method reported to the American Chemical Society by Dr. Robert H. Fulton of the Mellon Institute of Industrial Research.

This will accomplish two things: save the proteins so that they can be turned into beefsteaks by feeding to cattle, and eliminate it as an expensive nuisance for the industry to dispose of.

Dr. Fulton turned the trick by adding to the distillery waste a little bentonite, which is a special form of clay so fine that it becomes a kind of jelly when mixed with water. It took very little bentonite for the job—never as much as one per cent, and sometimes less than a third of one per cent.

The microscopic clay particles attracted the protein molecules to them, apparently electrically. The mass formed a precipitate which was easily filtered off or separated with a centrifuge. Extremely little protein remained in the liquid passing through the filters, indicating high efficiency of the method.

"The stock feeding value of the protein recovered," said Dr. Fulton, "is believed to be unimpaired except for increase in ash content, and may even possess some physiological virtues."

Science News Letter, September 18, 1943

Peach Yield Predicted

➤ PREDICTING yields of peaches in various parts of an orchard by analyzing leaves from the trees while the fruit is still small and green is the newest refinement in fertilizer practice. The chemists heard about it from P. D. Caldis, A. R. Brown and R. T. Marks of the California Packing Corporation.

The matter principally under investigation was the exact potash requirement from area to area in the orchard's variable soil. Analysis of the leaves for potassium showed how well or badly off the trees were in this vital chemical element.

Using these analyses as guides, the potash applied to the orchard soil was adjusted until now the yield of number one fruit was increased by nearly five tons to the acre.

Science News Letter, September 18, 1943

MEDICINE-CHEMISTRY

Rooster Made Like Hen

Pellets of synthetic female sex hormone inserted under the skin of young roosters make them resemble hens in appearance, and improve them for market.

➤ YOUNG ROOSTERS can be turned into something resembling young pullets, with their skinny stringiness changed to juicy, fat plumpness, with corresponding advantage in the market, by a treatment with compressed tablets of synthetic female sex hormone tablets. Development of this treatment was reported before the meeting of the American Chemical Society in Pittsburgh by Fred W. Lorenz of the University of California at Davis, Calif.

The hormone used was the comparatively new, low-cost synthetic known by the descriptive chemical name, diethylstilbestrol. Highly compressed tablets of this substance were inserted under the skin of cockerels about four weeks before they were due to be of market size. They very soon began to assume some of the appearance of female birds; their combs ceased to develop, their feathers took on a pullet-like pattern, even their bony structure changed. Most important from the market viewpoint, layers of fat developed under the skin, and the flesh remained soft and tender.

Mr. Lorenz suggested that in commercial applications of this method it would be well to insert the hormone pellets under the skin well up on the neck, to obviate any chance of a consumer's inadvertently getting the remnants of one of them in eating his share of the transmogrified young rooster.

Science News Letter, September 18, 1943

Soap Purifies Blood Serum

➤ WASHING AWAY, or at least soaping away, impurities from blood serum before using it for life-saving purposes was suggested by Dr. Hans Neurath and Dr. Frank W. Putnam of Duke University, as a means of avoiding the serum sickness that is always a risk in immunizing sensitive persons against certain diseases.

They have discovered, in experiments on animals, that various proteins, including blood serums, lose their shock-causing properties after treatment with synthetic soaps. Protein molecules have a coiled shape, which can be loosened or tightened by suitable manipulation with the soap solutions, to modify their chemical nature and hence their therapeutic effects.

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Papaya Used for Burns

➤ A NEW AID in the treatment of burns may come from a tropical fruit, it appears from the report of Dr. G. R. Cooper and Dr. J. W. Beard of Duke University, before the meeting.

Papaya juice, from the fruit and leaves of the tropical American papaw or papaya tree, contains an enzyme, papain, which helps remove damaged tissue in the burned area, the scientists found. Papain by itself is not too effective but when combined with an amino acid, cysteine, its action is increased. Addition of sodium salicylate, close relative of aspirin, makes the injured tissues more susceptible to the papain-cysteine action.

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New Female Sex Hormone

➤ SAVING womanhours for war service and war industry is believed possible with the aid of a newly synthesized female sex hormone, announced by Dr. William M. Malisoff and Eda Malisoff. The new compound, which is not secreted by any gland, combines sulfur with the natural female hormone known as estrone, and is the first of a series of synthetic sulfur hormones undertaken by Dr. Malisoff.

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MEDICINE

Kenny Theory Doubted

Study sponsored by the National Foundation for Infantile Paralysis, using electrical tests for muscles and nerves, shows Sister Kenny's ideas on polio wrong.

➤ SISTER KENNY'S views of what happens to muscles and nerves of infantile paralysis patients, on which her famous and fairly widely used treatment is based, are wrong, it appears from a report in the *Journal, American Medical Association* (Sept. 11).

The report is by Dr. Joseph Moldaver, of Columbia University College of Physicians and Surgeons and the Neurological Institute of New York. It covers a study by Dr. Moldaver which was sponsored by the National Foundation for Infantile Paralysis. This Foundation has also sponsored training courses in the Kenny method of treating infantile paralysis.

Dr. Moldaver's findings contradict completely the theory on which the Kenny treatment rests and support the century-old view of infantile paralysis as a disease of nerve destruction or damage and subsequent muscle degeneration due to injuries in the spinal cord.

The method, developed by Miss Elizabeth Kenny, an Australian nurse, is based on the theory that the paralysis and crippling in infantile paralysis are due to: 1. "muscle spasm;" 2. "mental alienation" which keeps the patient from using his muscles after the spasm is over; 3. "incoordination" resulting from the "mental alienation." The idea that there is some true paralysis has only recently been accepted by those who follow Miss Kenny's teachings. The muscle "spasm" is considered the most damaging symptom and is said to lead to degeneration if not treated.

To test these views, Dr. Moldaver made electrical tests on 49 infantile paralysis patients. These tests show whether and at what rate muscles and nerves respond to a stimulus. From this can be determined whether nerves supplying given muscles have been destroyed. On some patients tests, similar to brain waves and electrocardiograms, were also made of the electrical activity accompanying muscle contractions.

As a result of his studies Dr. Moldaver concludes:

1. "'Muscle spasm' is not 'the most damaging symptom' and does not lead to neuromuscular degeneration."

Instead of being a single condition, this "muscle spasm," Dr. Moldaver says, is a complex phenomenon. It results from a combination of the normal stretch reflex, irritation of the membranes covering certain nerve roots in the spinal cord, and increase of the normal tone of healthy, strong muscles or muscles opposed to weak or paralyzed ones.

2. The muscle "alienation" of the Kenny theory is not due to any mental condition or "physiologic block" but is a complete or partial loss of the muscle's power to contract due to damage or destruction of cells in the spinal cord which supply the motor function of muscles. Some muscles said to be "alienated" had completely disappeared, Dr. Moldaver found, and been replaced by fibrous tissue which may mask the wasting and disappearance of the muscles.

3. "'Incoordination' does not consist in a misdirection of nerve impulses. It is caused, if at all, by the inability of partially or totally denervated muscles to respond to otherwise normal nerve impulses."

In other words, as scientists have held for more than 100 years, the inability of the infantile paralysis patient to move certain muscles is due to the fact that the anterior horn cells of the spinal cord have been destroyed by the disease and not, as Sister Kenny holds, because pain, the spasm it caused and consequent lack of practice in using affected muscles made the patient forget how to contract the muscles.

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Only military uniforms and mourning *clothes* may be made in Germany after Sept. 30, it is reported.

PORTABLE DARKROOM—Photographers for the armed forces can carry by hand this complete darkroom, housing all materials for taking pictures and processing them in a box less than two feet on a side. When necessary, daylight developing and printing can be carried out in a truck or tent. After the war a civilian model of the outfit will probably be available from Eastman Kodak.

MATHEMATICS

New Device for Finding Distances on the Earth

➤ THE GREAT CIRCLE route and distance between any two points on the earth may be found without computation by use of a new device, Dr. William W. Flexner, associate professor of mathematics at Cornell University, announced to members of the American Mathematical Society meeting in New Brunswick, N. J.

Patent for this labor-saving device, the mechanical air route finder, is being applied for by Dr. Flexner and two other Cornell professors, Drs. Loren C. Petry and Oskar D. von Engeln.

Radio bearings can be used to find a person's location in much the same way that the altitude of heavenly bodies are used by a method recently developed in Germany by W. Immler. As the actual determination of radio azimuths at sea and in the air becomes more precise, such an accurate method of plotting will be most useful, Dr. Flexner pointed out.

Maps are essentially calculating machines which give direction, distance, or area on a sphere, Dr. Flexner said. They provide quick, graphic solutions to what might otherwise be laborious and even genuinely difficult problems concerning the earth. But a different map is usually required for each type of problem, so there is no such thing as a best type of map, Dr. Flexner said.

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GEOGRAPHY

Hitler's Hidden Home Just East of Brenner Pass

➤ HITLER'S hidden home in the hinterland is near Berchtesgaden, a German city on the Austrian border, about 80 miles east of Brenner Pass. Perhaps this is one of the reasons why Hitler is so anxious about the Pass and hopes that his enemies may be held south of the Alps.

Berchtesgaden has very little strategic value. It is not on the route to Berlin. It is a city of around 10,000 population, noted for its beautiful scenery, its extensive salt mines, an early Gothic abbey church, its winter ski runs, and its toy-making industries. Add Hitler to these.

Brenner Pass, however, is of the greatest strategic value. It is the only direct route which the Germans may use to enter or leave Italy. It is the route over which all supplies must move. Through it extends a railroad and an excellent highway. The season of snow will descend upon it any day now, and from that day on through the winter, passage may be maintained only with great difficulty. Snows are reported to be heavy. At the highest point, the pass is 4,500 feet above sea level.

The North Italy country, south of the recently bombed pass, is very mountainous, with many narrow valleys and winding roads. A further plentiful supply of bombs from the air might impede or entirely block traffic to and from the north and create a shortage of supplies, equipment and ammunition for the Germans north of the Po. By requisitioning the Italian food supply the Nazis may keep themselves fed. German coal, on which northern Italy's industries depend, would be unavailable. Italy mines relatively little coal.

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PHARMACY

New Morphine Substitutes Now Generally Available

➤ DEMEROL, synthetic pain-killing drug devised as a substitute for morphine, is becoming generally available, Dr. Theodore G. Klumpp, president of Winthrop Chemical Co., Inc., announces.

Larger doses of one of the B vitamins, ribaflavin, for people too sick to take it in food or vitamin pills, will also be possible through a new product of the same company now on the market under the name of Betasynplex "Niphanoid." This new vitamin product contains other synthetic B vitamins but its chief virtue, it appears, is the fact that it makes possible the giving by hypodermic injection of relatively large doses of riboflavin.

Demerol, the morphine substitute, will be available only on physician's prescription. It is said to give relief in a large variety of conditions ranging from childbirth to asthma. First announced slightly over one year ago, the new drug has had extensive testing in the laboratory and in treatment of patients. Its addiction or habit-forming property is believed to be less than that of morphine. During the testing period it was available only in small amounts for research purposes. Release by the U. S. Food and Drug Administration and solution of production problems now make possible its use by physicians generally for treatment of their patients.

Science News Letter, September 18, 1943

IN SCIEN

MEDICINE

Infantile Paralysis Cases Have Reached a New High

➤ INFANTILE PARALYSIS cases reached a new high for the current epidemic, 957 cases being reported throughout the nation for the week ending Sept. 4, latest on which figures are available. The previous week's total reported to the U. S. Public Health Service was 872.

Signs that the epidemic is spreading east and north appeared in the reports from the states. Increases were reported in Connecticut, New York, Ohio, Michigan, Wisconsin, Iowa, Missouri. Kansas, Utah and Washington. California and Texas, the first to feel the brunt of the epidemic, had fewer cases, which gives some hope that the outbreak in those states may soon be over.

Science News Letter, September 18, 1943

MEDICINE

Results of Polio Treatment Difficult to Evaluate

➤ INFANTILE PARALYSIS affects patients so differently in different epidemics that the effects of any one method of treatment can hardly be judged by comparing results in one year with those in another, Dr. Edward L. Compere, of Northwestern University Medical School, told the American Congress of Physical Therapy in Chicago.

Chicago has just had an epidemic of infantile paralysis which appeared "vastly different" from that of 1942, he pointed out. The death rate was higher but the severity of paralysis in those who survived the initial infection was less. Most of the victims in this year's epidemic have been children under 10 years whereas last year a high percentage of patients were grown-ups and still more were adolescents with only a few children being attacked.

Dr. Compere gave full credit to Miss Elizabeth Kenny for dropping a "bomb shell" into the midst of physicians who were using largely static methods when she first advocated her method of treatment. His own plan of treatment, he said, includes "some Kenny and some orthodox methods."

Science News Letter, September 18, 1943

E FIELDS

PHYSICS

"Gibson Girl" Transmitter Saves Airmen Down at Sea

➤ ARMY AIRMEN forced down at sea may be saved by the "Gibson Girl," a small radio-transmitter with an hour-glass shape which sends the SOS distress signal when a crank is turned.

The device was developed by the Signal Corps, Army Service Forces, in collaboration with commercial firms. It is now standard equipment on all Army Air Forces planes making overwater flights. Many lives have already been saved by the "Gibson Girl."

A small button on the face of the transmitter allows regular Morse code messages to be sent, as well as the automatic SOS. For those who do not know dots and dashes, the code is printed on the top of the set.

Two methods of raising the 300-foot copper wire aerial are available: a collapsible box kite for windy weather and two rubber balloons when the air is calm.

The Axis has similar apparatus but radio engineers consider the American version far superior.

Science News Letter, September 18, 1943

PSYCHOLOGY

Shortage of Psychologists Curtails Nazis Testing

➤ ALLIED FIGHTERS in the future may not have to face a highly selected group of combat pilots and officers such as the British and Russians met in the early part of the war.

A report in a Swiss medical review, *Praxis,* just received in this country, reveals that the psychological testing service of the German armed forces was considerably curtailed after the first Russian winter. This cut was made first in the Luftwaffe and then in the army.

Calling attention to this report in a communication to the American scientific journal, *Science,* (Sept. 3) Dr. H. L. Ansbacher, Brown University psychologist, attributes the reduction in psychological testing to shortage of psychologists and the elaborate, impractical nature of the German tests.

In place of the group tests preferred by American psychologists because they make possible the testing of large numbers in a relatively short time, the German military psychologists developed a clinical type of examination. By this method, one man would be studied by a group of usually six psychologists for two whole days to see what he would do in many realistic test situations.

"While the method was good," Dr. Ansbacher comments, "it was very time-consuming and required a relatively large staff of highly trained psychological personnel. Before the war only 100,000 men a year could be handled in this way."

Eight months after the invasion of Poland, in May, 1940, a shortage of military psychologists in Germany was reported in a German military psychology journal. The Nazis tried to meet this shortage by giving a new academic degree in psychology with requirements lower than those needed for the Ph.D. in psychology. But even this step failed to give the Luftwaffe and the Army enough psychologists, apparently.

Science News Letter, September 18, 1943

CHEMISTRY

Cork-Oaks To Be Grown Within the United States

➤ A PROGRAM to promote the growing of cork-oaks in this country, to do away with future risks of being cut off from the supplies from Spain, Portugal and North Africa on which we have always depended, was outlined before the American Chemical Society by Dr. Giles B. Cooke of the research department of the Crown Cork and Seal Company.

A relatively limited number of mature cork-oak trees, bearing good crops of acorns, already exists in the United States, he told his listeners. Arrangements have been made to collect all available acorns that are produced, and to distribute them, or seedlings grown from them, to persons willing to plant and care for a number of the trees.

It is known that cork-oaks will grow well in all eastern states from Maryland, Virginia and Kentucky on south, and west of the Mississippi in Arkansas, Louisiana, Texas, New Mexico, Arizona and California. Many private individuals, as well as school science clubs, throughout this area have already indicated their intention to cooperate in the program. First harvests of cork can be expected after trees reach an age of from eight to 15 years.

Science News Letter, September 18, 1943

CHEMISTRY

Mosquito-Repelling "Dope" Made Entirely of Synthetics

➤ MALARIA mosquitoes, zooming in on Yanks in New Guinea and the Solomons, have received as unpleasant a surprise as the first Zeros that tackled a squadron of Lightnings. They just ran into something too strong for them.

What it was, members of the American Chemical Society were told at their annual autumn meeting in Pittsburgh by Philip Granett, G. C. Furness and W. Rudolfs, who did their work at the agricultural experiment station of the state that used to be considered the hub of the mosquito universe—New Jersey. That it has shaken the hold of this ancient and unenviable reputation is due in no small part to the work of New Jersey scientists and engineers.

The new mosquito-repelling "dope" contains no oil of citronella or any of the other old-time standbys. It is made entirely of synthetic materials, especially invented by chemists who had a grudge against mosquitoes. It bounces them off with a more violent "zing," and it lasts from four to six times longer than any of the old compounds. Yet its odor is not disagreeable to human noses. It is known at present simply as Formula 612.

None is available for civilian use at present; the Army and Navy are taking every ounce that the producers can turn out, for use in the many mosquito-infested lands where our fighting men serve, all the way from Alaska to the Congo, and from the Solomons to Sicily.

Science News Letter, September 18, 1943

ORNITHOLOGY

Rare South American Birds Added to Zoological Park

➤ THE SCARLET cock-of-the-rock, one of the rarest and at the same time most beautiful of South American birds, is now represented by a pair newly added to the bird-house population of the National Zoological Park in Washington.

The species lives in a rather limited area, on the rainy Andean uplands of Ecuador and Colombia. The birds are of about equal size, approximately as large as a small pigeon, but as is frequently the case with birds their coloration is quite different. The male has gorgeous scarlet plumage, while that of the female is a rich brown.

Science News Letter, September 18, 1943

CHEMICAL WARFARE

Flame Thrower Kills

Designed to make it hot for Hitler and Hirohito, this modern dragon with a tongue 100 feet long blasts the enemy from inaccessible spots.

By JOHN A. BOWLER, JR.

➤ MAKING it hot for the Axis is the job of the improved flame thrower developed by the Chemical Warfare Service which is already being used to effectively "burn and ruthlessly destroy" the enemy.

This was demonstrated at the Munda airfield, where the flame thrower burned its place into a page in the history of World War II. There U. S. Marines and Army Combat Engineers destroyed with flame throwers 67 Japanese pillboxes and other fortifications which had withstood aerial bombardment and every other kind of shell the Navy and the Army could hurl at them.

The flame thrower, out of action, looks harmless enough. It might be a new kind of chemical fire extinguisher, rather than a dispenser of flame and smoke, or it might be mistaken for equipment for spraying trees with insecticide. When the war is over it probably could be converted to either of these prosaic uses.

But the flame thrower in action is something to fill an enemy with terror. Anyone who witnessed a special demonstration of the flame thrower conducted recently will agree.

The demonstration was conducted by the New York Chemical Warfare Procurement District on the grounds of a manufacturing plant in a quiet little New Jersey town. After a brief explanation, a Chemical Warfare officer pointed the long metal tube of a flame thrower across an open field and released a half dozen virtual blasts from hell.

Radiated Heat Intense

There was the buzzing sound of the ignition mechanism, then the hissing of a stream of inflammable gas, then a series of low roars like a hurrying mountain stream. The roaring was the sound of the combustion of the long stream of a secret liquid fuel. A billow of dense black smoke spread upward and dispersed into the sky after each blast from the flame thrower.

The radiated heat was intense. Together with the brilliance of the flames and the threatening hissing and roaring sounds, it caused spectators hastily to draw back out of the reach of this mechanized fiery dragon spewing death and destruction. But there was no danger. Nearby stood a fire truck, an ambulance, a rescue squad, not so much because the flame thrower is dangerous to anyone not on the receiving end, as because the Army takes precautions against even improbable dangers.

A fake pillbox and a dummy enemy soldier were set up in one corner of the field. An officer directed several soldiers in placing smokepots. In combat, he explained, artillery smoke shells, hand smoke grenades, and portable smokepots all are used to maintain a screen of smoke around the target so that enemy gunners cannot see more than a few yards in front of their own positions.

Smoke Confuses Enemy

Obscuring smoke used this way reduces the effectiveness of enemy fire to four per cent of normal. This is three times as efficient, where it can be employed, as protective smoke placed in front of, or on, the advancing force to make it less visible to the enemy, which reduces the effectiveness of the enemy's fire to about 12 per cent of normal.

The wind blew the smoke toward the fake pillbox. If the dummy had been an enemy soldier he could scarcely have seen his hand in front of his face. A soldier, armed with the flame thrower, and guarded by a rifleman on either side, approached the objective. The three men disappeared from the observer's view into the smoke. Buz-z-z-z, swish-sh-sh-sh, roar-rrRR! A stream of flame shot out and widened into a huge cone of fire. The silhouettes of the three soldiers stood out against the blaze. Several times there were the buzzing, the swishing, the roaring, the blaze. But in less than a minute the advance was over, the pillbox was a roaring furnace in which the blazing dummy could just be discerned.

The flame thrower was developed, manufactured and issued, by the Army's Chemical Warfare Service. Engineers are continuing research on its improvement. It ordinarily is used by Army Combat Engineers personnel and special Marine Corps units trained in the operation of the weapon and in its tactical possibilities and limitations. Each flame thrower, say the combat engineers, has its own "personality," and a soldier comes to know just how to handle his own weapon to get the best performance from it.

Men who know the flame thrower describe it as a "weapon of opportunity." It can do a good job "if you can get it to the right place at the right time." It is best used against confined objectives, such as pillboxes, caves, and concrete embrasures. It is particularly useful in cleaning up machine gun nests

FLAME THROWER—The two largest tanks of the apparatus contain enough fuel for several shots of flame. Two are used instead of a single large tank to reduce the soldier's silhouette, making him a smaller target. The third tank contains inert gas to provide pressure. Rubber hose connects the tanks to the "gun," a metal tube about four feet long with a nozzle inside near the front end.

TONGUE OF FIRE—Roaring flames to blast the enemy from inaccessible spots shoot from the improved flame thrower recently exhibited by the Army Signal Corps.

down in the ground which cannot be reached effectively with rifle fire.

One of the chief values of the flame thrower is psychological, say the men who have developed and used the weapon. It creates panic among enemy units as they see its blasts of fire destroy their installations. Flame is a tangible, visible threat. The impulse to flee from it is powerful. Pockets of resistance sometimes crumble even before the flames from this weapon have seared them.

The effect of the flame thrower is deadly in three ways:

1. It produces terrific heat.

2. It leaves, as a product of combustion, a high concentration of carbon monoxide, the same deadly gas that has caused many fatal accidents in closed garages.

3. It uses up the oxygen of the air in any confined space, thus reducing the oxygen concentration below that necessary to support respiration.

The smoke produced by the incomplete combustion of the liquid fuel is helpful to the soldier using the flame thrower. It protects him from radiated heat coming from the burning fuel, and it tends to screen him from the enemy's observation.

Flame is one of the oldest weapons known to mankind. It undoubtedly was used in prehistoric intertribal warfare. The flame thrower used during the last war, without smoke, became an obsolete weapon. It was revived and used effectively, with smoke, by the Russians in Finland and by the Germans in Belgium. Long before Pearl Harbor, the armed forces of the United States were at work on an improved flame thrower.

The flame thrower is, in theory, quite similar to the blowtorch. It consists of a high-pressure fuel tank and a gas ignition system. Extremely important, of course, is the fuel. The U. S. Army uses special fuel blends, products of much research. The ideal fuel must combine the best burning and heat-producing qualities with maximum range. This means that it must not burn so rapidly that it is consumed before the fuel stream reaches the greatest distance to which the pressure system can eject it. The compositions of the fuel blends used in combat are military secrets. Different fuel blends are used in the Arctic and in the tropics because the viscosity of a fuel affects its range in the flame thrower.

The fuel is ignited as it passes through the "gun's" nozzle, emerging as a narrow, rope-like, blazing mass, which starts to taper into a cone of hot, searing flame at 10 feet.

How hot is the inferno produced by the flame thrower? To answer this question would involve technical problems which the Chemical Warfare Service has not taken time out to solve. But the flame thrower's flame certainly is hotter than many furnaces, and it has proved to be far too hot for enemy pillboxes.

Two fuel tanks carry enough fuel for several blasts of flame. A smaller tank contains inert compressed gas to provide necessary pressure.

Chemical Warfare Service engineers are constantly improving the design of the flame thrower to obtain greater fuel capacity, less weight per unit of liquid fuel, and greater range of effective flame. The effective range at present is about 100 feet. The flame thrower now in use weighs considerably less than 100 pounds and is carried on the soldier's back.

As efficient as the flame thrower is, Chemical Warfare Service engineers say, the model now in use is on the verge of becoming obsolete, for vastly superior weapons soon will be in use.

Science News Letter, September 18, 1943

PSYCHOLOGY

Brain-Injured Child Thinks Stones and Lightning Live

➤ "THE WIND knows when it blows against the house, because it makes a noise." That is what a large proportion of brain-injured children think.

One way of distinguishing between retarded children whose lack of mental growth is due to brain injury, and those who have faulty inheritance, may be in this way the brain-injured have of attributing life to inanimate objects, experiments conducted at the Wayne County Training School by Dr. Heinz Werner and Miss Doris Carrison revealed.

When the brain-injured children are questioned about wind and clouds and flashing lightning, nine out of ten of the answers indicate that these natural forces are alive. More than half attribute life to stones, pencils, knife, mirror and button. More than a third indicate that a chair is mean when it bumps small legs, a stone is lonely when it lies neglected in the road.

Among children of just about the same intelligence and mental age, whose mental defect "ran in the family," there is much less of this animistic thinking. Only about a third of their answers attribute life to inanimate objects; about eight out of ten indicate that natural events or forces are alive. Only about one out of ten answers attribute feeling to inanimate objects.

Science News Letter, September 18, 1943

MEDICINE

Plasma Serves at Home

Plentiful supplies of available OCD plasma helped save the lives of civilian casualties in the train wrecks and hotel fire of Labor Day week-end.

➤ FORTUNATELY for the injured survivors of the two train wrecks and the hotel fire which brought a dark and bloody finish to the Labor Day week-end, not all the blood plasma donated by patriotic Americans in the past year has gone to war.

The emergency medical service of the Office of Civilian Defense had on hand 158,250 units of plasma, some of it dried, some frozen and some fluid. These supplies were acquired for use in the event of air raids or civilian disasters such as the train wrecks at Philadelphia and near Syracuse and the hotel fire in Houston, Texas. On July 1, there were 670 OCD plasma storage depots in 316 cities throughout the country.

A total of 2,300 units of blood plasma, more than was required in the emergency, was on hand in Philadelphia, Dr. Victor Vogel, administrative director of the OCD plasma service, stated.

Dr. John B. Alsever, technical director of the service, went to Philadelphia to aid local OCD emergency medical service authorities and get first-hand information on how the plasma service works in the emergency.

In Syracuse there were 656 units of OCD blood plasma. For the Houston fire, the Harris County blood bank of the OCD had over 1,900 units of blood plasma. If supplies in any community were not sufficient, OCD emergency medical service directors could order more transferred from the nearest storage depot or cooperating hospital banks.

Plasma, the fluid part of the blood, has been given a large share of the credit for saving the lives of the wounded on the world's battle fronts. It is just as valuable for fighting the shock and infection that threaten lives of civilians injured in accidents and fires. It played a vital part in saving survivors of the Boston night club fire last November, much of it coming from the OCD reserve of 2,600 units then in that city.

The Office of Civilian Defense supplies of plasma have been built up in three ways. First and most important, grants were given through U. S. Public Health Service funds to 170 civilian hospitals throughout the country for setting up and equipping their own blood and plasma banks. Each of these hospitals must set aside from its bank for OCD use one unit of plasma per hospital bed. Collection of the blood is done by the hospitals without interfering with the American Red Cross collection of blood for the fighting services.

Second, with the permission of the Army which has the monopoly on the output of all the nation's plasma drying plants, the OCD bought 50,000 units of dried plasma for storage in depots throughout the country whence it could be rushed to the scene of a disaster.

Third, the Army and the Red Cross gave permission to the OCD to buy from the firms drying plasma some of their surplus of frozen plasma. Plasma is frozen before it is dried. The Army and Navy need dried plasma because it is easier to transport. Frozen plasma, however, can be converted back to liquid form and transported for civilian use at home. Through the OCD purchase of frozen plasma, some of the supplies collected by the Red Cross stay in the communities where they were given for use in civilian disasters.

Science News Letter, September 18, 1943

STATISTICS

Accident Rates Low

Despite the wreck of the Congressional Limited, the accident rate for this year will probably not be unusually high in terms of passenger miles.

➤ IN SPITE OF such wrecks as that of the Congressional Limited, figures indicate that the accident rate on American railroads for this year will not be unusually great when it is figured in terms of passenger miles, that is, the total number of miles traveled by all passengers during the year.

Large increases in passengers carried and trains operated have so increased railroad traffic that when the tragic Labor-day wrecks near Philadelphia, Baltimore and Syracuse have been included, the accident rate is still not much greater than in prewar years.

Reports secured from the Association of American Railroads show that passenger business during the first seven months of 1943 has been greater than for the 24 months of 1939 and 1940 combined. During 1939 passengers traveled a total of 22,712,941,000 miles; during 1940, a total of 23,815,598,000. The preliminary reports for 1943 show that approximately 47,790,000,000 miles were traveled from January through July this year.

A total of 27 deaths to passengers on trains due to train and train-service accidents were reported for the year 1939; 75 for 1940. During the first seven months of this year 48 deaths have resulted from such accidents.

Figures issued by the Interstate Commerce Commission show a marked decrease during the past two decades in the number of deaths to passengers on trains due to train and train-service accidents when the total number of miles traveled is considered.

Whereas the number of fatalities per hundred million passenger miles to passengers on trains was .169 in 1942, back

U.S. TANK IS BEST, SAY NAZI EXPERTS

Germany Will Doubtless Copy Gyroscopic Feature of General Sherman Tank, Berlin Radio Declares

By The Associated Press

A special new German institute for testing captured tanks has adjudged the American "General Sherman" the best type the Allies have turned out, the Berlin radio said yesterday, adding that the Nazis "doubtless" would copy its construction—particularly the gyroscopic gun-mount, which they consider its outstanding feature.

"Doubtless" Best Type

"According to the findings of the Institute," said the broadcast, recorded by the Associated Press, "the 'General Sherman' tank is doubtless the best type the allied armament industry has yet produced.

"A special innovation on this type tank, which by a gyroscopic system prevents the gun from being affected by the jolting of the tank when traveling on rough grounds, greatly interested the German experts. They believe this to be the first attempt at borrowing from the construction of warships for the construction of arms for warfare on land, and doubtless it will be copied soon."

WHEN THE GERMAN RADIO paid glowing tribute to the General Sherman tank—for once it was telling the truth.

You see, tank battles used to be stop-and-go affairs, because a tank's heavy cannon could be aimed accurately *only when the tank was at a complete standstill.*

That was bad—because every stop naturally made the tank a juicy target for the enemy.

Then the Army Ordnance Department called on American industry for the solution of this problem. So the men of Westinghouse went into a huddle. And out of it came what has been called one of the greatest military developments of this War—a tank gun stabilizer that permits *incredibly accurate fire while the tank is charging ahead at full speed over rough ground!*

And then, to button up the job, Westinghouse went into production on these gun stabilizers so fast and so thoroughly that almost before you could say "El Alamein," they were being produced in sufficient quantity to equip every American tank!

No wonder the Germans thought well of the General Sherman. And no wonder they considered its gun stabilizer its outstanding feature. For this one device has revolutionized the whole combat technique of tank fighting!

For us, tank battles are no longer stop-and-go affairs, with every stop offering the enemy a "sitting pigeon." American tanks are now more than 500% deadlier than ever before.

And the Westinghouse Research Laboratories, which developed the device—the Westinghouse engineers, who perfected it—and the men and women of Westinghouse who make it in great numbers—are proud as Punch.

Westinghouse Electric & Manufacturing Company, Pittsburgh, Penn.

» » **Westinghouse** « «

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

● RADIO

Saturday, Sept. 25, 1:30 p.m., EWT

"Adventures in Science" with Watson Davis, director of Science Service, over Columbia Broadcasting System.

in 1922, it was .397. In 1923 it was .259; in 1924, .291; in 1925, .362; and in 1926, .334. In 1927 it decreased to .142, continuing low for a number of years. In 1928, it was .170; in 1929, .225; and in 1930, .123. In 1931, the ratio was .109; in 1932, .076; in 1933, .232; in 1934, .149. In 1935, it again reached a low figure, this time the ratio being .097. In 1936, it was .076; in 1937, .073; while in 1938 a large number of deaths brought the ratio up to .319. In 1939, it was .119; in 1940, .315; in 1941, .116; in 1942, .169; and for the first seven months of 1943—before the series of tragic accidents occurred—it was as low as .101.

The Division of Safety of the Interstate Commerce Commission went into action to investigate the disaster on the Congressional Limited just as it does all railroad accidents. Four or five ICC inspectors were stationed at Philadelphia and two or more of them, together with experts rushed to Philadelphia from Washington, will sit in on the investigations conducted by the state, the railroad, and other authorities. Eventually there will be prepared a detailed report on the accident so that any safety measures that are suggested may be put into effect for the protection of future railroad travellers.

Science News Letter, September 18, 1943

New Zealand has launched the first of hundreds of *motor boats* to be built for the mosquito fleet in the Pacific.

Over 185,000 trained wartime volunteer forest fire fighters are now organized to help protect American *forests* from fall fires.

NUTRITION—BOTANY

NATURE RAMBLINGS

by Frank Thone

Neglected Food Resource

➤ AUTUMN brings rain, and rain will bring an increase in the wild mushroom crop. Mushrooms have no great intrinsic food value, but they have a very decided flavor appeal, and so make a very good addition to war-time dishes that need a little help in that direction. We are beginning to realize that mushrooms were a trifle superfluous in connection with beefsteak, but that they can do much in rendering stew or baked hash acceptable to appetites still hankering after the fleshpots of 1941.

The mushrooms of the marketplace are all very well in their way, but after all every botanist knows that these belong to a species at best only average-good in its flavor. The one great virtue of this species, the common field agaric, is that it has consented to grow under cultivation. The many mushroom species that are finer in flavor, more delicate in texture, have remained obstinately wild, and have to be hunted in their native woods and meadows if they are to be enjoyed.

Many persons maintain an entirely reasonable fear of getting poisonous mushrooms instead of edible ones if they do their own hunting. This is the more justified, in that no traditional rule-of-thumb test, like the blackening of a silver spoon or the peeling of the cap, is at all dependable. The only way to know poisonous mushrooms from edible ones is to learn to recognize them at sight.

Fortunately, that is not as difficult to do as is often imagined. You don't have to be a college-trained botanist to identify mushrooms. There are several excellent illustrated books on the subject available in most public libraries. The U. S. Department of Agriculture, and most of the state experiment stations too, have good pamphlets on mushroom identification and cooking that can be purchased for a few cents.

The one thoroughly dangerous mushroom genus that grows in practically all parts of the United States and Canada is fortunately one of the most easily identified. This is the death-cup or amanita. It has a double sign: a white cup at the base of the stalk (sometimes half-hidden in the leaves or loose soil) and a loose ring around the stalk itself, about half or two-thirds of the way up. If it has ring alone, or cup alone, it is not a dangerous species; if it has both cup and ring it is an amanita and should be left severely alone.

Science News Letter, September 18, 1943

INVENTION

Paper Nursing Bottle Saves Washing Trouble

➤ THOROUGH weariness with washing of nursing bottles is reflected in patent 2,328,354, obtained by Elizabeth Montano of Palm City, Calif., on a nursing bottle made of paper, which can be used once, then thrown away. The nipple, made of sponge rubber, is protected with a fabric cover, which is likewise expendable.

Science News Letter, September 18, 1943

• New Machines and Gadgets •

❁ *TWO MINERAL OILS have been developed: one to replace palm oil as a lubricant in manufacturing cold rolled steel, the other as a substitute for olive oil in wool processing. The new oils, developed by petroleum chemists, are made by adding various substances to an ordinary mineral oil.*

Science News Letter, September 18, 1943

❁ *MILITARY GOGGLES which aid soldiers to follow the path of tracer bullets in broad daylight are now in use in the armed forces. They may be used also by pilots to adapt their eyes to darkness. The goggles are fitted with red plastic lenses, or lenses of other color for special purposes.*

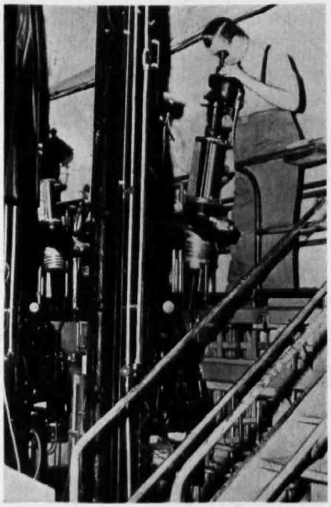
Science News Letter, September 18, 1943

❁ *SMALL WATCH and precision instrument parts are thoroughly cleaned in a new machine. They are placed in a wire basket rotated by an electric motor, dipped in a jar of strong cleaning fluid, dipped in a second jar with a weaker fluid, again in a rinsing liquid, then dried electrically in a fourth jar.*

Science News Letter, September 18, 1943

❁ *PRECISION DRIFTMETERS help navigators keep big bombers on the correct course by calculating drift caused by wind currents. A driftmeter, now in mass production, is shown in the photograph being given a final inspection. Should this instrument be issued with a hair-breadth error in adjustment, it might put a long-range bomber miles off its course.*

Science News Letter, September 18, 1943



❁ *FILTER PHOTOMETERS for rapid, accurate chemical analysis are now available in two new compact types called photelometers, developed especially for industrial and clinical uses.*

Science News Letter, September 18, 1943

❁ *A PHOTOELECTRIC safety control used on electric sewing machines stops a machine instantly if the fingers of the operator come dangerously near the needle. The device goes into action when the fingers intercept a beam of light.*

Science News Letter, September 18, 1943

❁ *LAMINATED SHEETS of phenolic plastic reinforced with aluminum alloy strips are now used as a new type of flooring in gigantic warplanes and plans are under way for installation on postwar passenger planes. Over 400 pounds of weight is thereby saved in a single 50-ton flying boat.*

Science News Letter, September 18, 1943

❁ *RESIN-TREATED PORTLAND CEMENT, now used in road construction, resists winter deterioration due to freezing, thawing and applications of salt for ice removal. A special pine wood resin is used, one tablespoonful to each sack of cement.*

Science News Letter, September 18, 1943

If you want more information on the new things described here, sent a three-cent stamp to SCIENCE NEWS LETTER, *1719 N St., N.W., Washington 6, D. C., and ask for Gadget Bulletin 174.*

Science News Letter, September 18, 1943

MEDICINE

Better Medicines Promised; Test Methods Inadequate

➤ BETTER, SAFER medicines are promised by an improved method for detecting lead contamination, reported to the meeting of the American Pharmaceutical Association in Columbus, Ohio, by Mrs. Celesta A. Steinmetz and Dr. Melvin W. Green of the American Institute of Pharmacy, Washington, D. C.

Inadequacy of present procedures to control lead content in medicines was revealed by laboratory tests which showed that lead contamination of commercial products varies widely, not only from one manufacturer to another but in different lots of a given medicine from the same company.

This may be dangerous, in some cases, since even small amounts of lead taken regularly, added to the harmless traces present in foods, may accumulate in the body to produce lead poisoning.

To assure safer, purer medicines, Mrs. Steinmetz and Dr. Green developed a simple, rapid method of detecting lead from the Bambach dithizone procedure already in wide use for testing foods and biological remedies.

"The test yields reliable results within reasonable limits of error," they reported, "and is sufficiently accurate to be used as a limit test for drug standardization."

After applying the test to 31 drugs and preparations in the National Formulary, an official book of drugs, the researchers stated that "it would appear to be advisable to consider a limit for the lead content of many of the National Formulary drugs and a level of 10 parts per million would appear to be a reasonable goal." This is only a fraction of the amount now found in some drugs being prescribed, the test revealed.

Science News Letter, September 18, 1943

First Glances at New Books

➤ TACTICS is the principal concern of HOW THE ARMY FIGHTS, by Capt. Lowell M. Limpus. There have been many books describing weapons and organization for the layman; this one advances our information by giving a clearer picture of the teams in action. (*Appleton-Century*, $3).

Science News Letter, September 18, 1943

➤ BEWILDERING, to the average citizen, are the involved maneuvers of the various agrarian pressure groups during an average Washington legislative season. Claims and counter-claims fill the air, with Farm Bureau Federation, National Farmers Union, the Grange, and John L. Lewis' Local 50 tangled in battle like factions at an old-time Kilkenny fair. An experienced Washington journalist, Wesley McCune, undertakes in THE FARM BLOC to give us a picture-of-the-moment, rather than a critical analysis, of the situation, introducing as little of his own personal bias as may be. (*Doubleday, Doran*, $2.)

Science News Letter, September 18, 1943

➤ SCIENTISTS are usually individualists, yet the pattern of the world ahead seems to indicate a considerable degree of collectivism and planning in scientific research as in practically everything else. In THE SCIENTIFIC LIFE, John R. Baker, a well-known British zoologist, gives his reaction to this prospect (which is definitely negative) and his reasons therefor, which are vigorously presented. (*Macmillan*, $2.50.)

Science News Letter, September 18, 1943

➤ ANIMAL TRACKS in snow or mud are signatures that tell him who can read what creature has passed that way. Under this title, George F. Mason, staff artist at the American Museum of Natural History, presents a small book in which accurate sketches of the tracks are "matched" with vividly characteristic pictures of the animals that make them, with brief descriptive text to help out. With winter approaching, this is an excellent book to get now. (*Morrow*, $1.50.)

Science News Letter, September 18, 1943

➤ SHADE TREES are gracious things, making all the difference between bleakness and a pleasant place to live. Ephraim Porter Felt, veteran worker for the welfare of trees, gives us a new book, SHELTER TREES IN WAR AND PEACE (*Orange Judd*, $2.50), recommending good trees to plant and telling how to care for them.

Science News Letter, September 18, 1943

➤ PHILOSOPHY always looks to the science of its day for its materials; in SCIENCE AND CRITICISM: THE HUMANISTIC TRADITION IN CONTEMPORARY THOUGHT, Herbert J. Muller ranges over many fields of research from indeterminacy in physics, to the peck order in social biology and the role of the cortex in emotional reactions, selecting what seems to be germane to his theme. Those who try to make an intelligible synthesis of the bewilderingly diverse phenomena of present-day science will do well to read this book (*Yale Univ. Press*, $3.75.)

Science News Letter, September 18, 1943

➤ COLLEGE STUDENTS will find GEOGRAPHY OF LATIN AMERICA, by Fred A. Carlson, a volume to fit their particular needs. It is a revision of a book first printed in 1936. The book is a readable work with many maps and illustrations. (*Prentice-Hall*, $6.)

Science News Letter, September 18, 1943

➤ AN OVERALL EXPANSION in production, coupled with continued decline in farm employment, is expected by Harold Barger and Hans H. Landsberg, in AMERICAN AGRICULTURE, 1899-1939: A STUDY OF OUTPUT, EMPLOYMENT AND PRODUCTIVITY. The book is written at professional level, but should be of interest to economists. (*National Bureau of Economic Research*, $3.)

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• Just Off the Press •

THE ANNUAL OF THE AMERICAN SCHOOLS OF ORIENTAL RESEARCH—William Foxwell Albright—*Amer. School of Oriental Research*, 255 p., plus 73 plates, $1.25. The volume is entitled, *The Excavation of Tell Beit Mirsim*. In it students will find a detailed description of the materials brought to light in the Israelite town, which was occupied from about 1200 to 589 B.C.

COOK IT IN A CASSEROLE: WITH CHAFING DISH RECIPES AND MENUS—Florence Brobeck—*Barrows*, 183 p., illus., $2.

ELEMENTARY ELECTRICITY FOR RADIO STUDENTS—W. E. Flood—*Longmans, Green*, 64 p., illus., 40 c., paper.

ENGLISH COMMUNICATION: A HANDBOOK OF WRITING AND SPEAKING—Kendall B. Taft, John F. McDermott, Dana O. Jensen, W. Hayes Yeager—*Farrar and Rinehart* 435 p., illus $1.40. A handbook of basic principles in grammar and composition with special chapters on précis writing, technical reports, research papers and military correspondence.

FIGHTING FIRE—Burr Leyson—*Dutton*, 254 p., illus., $2.50 Rev. ed.

GEOLOGICAL EVOLUTION—George Perry Mummey—*Wetzel Publ.* 47 p., illus., $5. A thesis on light; continental drift; the moon; mineral deposits of the earth; geysers and Saturn; also nature's chemical laboratory and geological evolution of Florida.

KAISER WAKES THE DOCTORS—Paul de Kruif—*Harcourt, Brace*, 158 p. $2.

MANUAL WORKBOOK FOR BIOLOGY SEASON BY SEASON—M. Anthony Payne—*American Book Company*, 250 p., illus., 88c.

MATERNAL OVERPROTECTION—David M. Levy—*Columbia Univ.*, 417 p., $4.50.

PSYCHOSOMATIC MEDICINE: The Clinical Application of Psychopathology to General Medical Problems—Edward Weiss and O. Spurgeon English—*Saunders*, 687 p., illus., $8.

STUDIES IN ARC WELDING: Design, Manufacture and Construction—Technicians and engineers—*James F. Lincoln Arc Welding Foundation*, 1295 p., illus., $1.50 in U. S. A., $2 elsewhere.

UNDER A LUCKY STAR: A Lifetime of Adventure—Roy Chapman Andrews—*Viking Press*, 300 p., $3.

UNIT MEDICAL RECORDS: Hospital and Clinic—Dorothy L. Kurtz—*Columbia Univ.*, 110 p., illus., $2.