

Do You Know?

Rice fields in California are planted from *airplanes*.

Ants can be controlled indoors by the use of thallium sulfate.

Australia raised 450,000 *turkeys* last season for American soldiers.

Swordfish, which sometimes grow to 12 feet in length, are tiny fish about an inch long when first hatched.

Helicopter service has been authorized in Mexico by the government to connect remote communities with the country's chief airlines and airports.

Nicotine serves an important role in insect control because it has the unique properties of being a contact poison, stomach poison and fumigant.

The recent eruption of *Vesuvius* has put 50,000 acres of farmland out of use for this year and rendered 200,000 acres fit for partial use only.

Zein, now produced in commercial quantities, is a protein extracted from corn; dissolved in alcohol, it forms a lacquer-like solution usable as a substitute for shellac.

Ingredients of aviation fuel, synthetic rubber and TNT are quickly determined by a new *optical method* by passing infra-red beams through samples; certain wavelengths are absorbed by various ingredients.

A *mallard duck* in the Philadelphia zoo stole away from her home, hatched a brood of ducklings on the bank of a nearby river, and later proudly marched her new family back to the zoo through the main entrance gate.

Two sprays to control the American dog tick, or *common wood tick*, have been developed by the U. S. Department of Agriculture; one uses nicotine sulfate, the other a three-to-one mixture of sodium fluoride and nicotine sulfate.

Mexican bananas may soon become more plentiful in the United States because of two 2,000-ton American vessels chartered to Mexico to carry bananas from Mexican ports to Brownsville, Texas, and general cargo southward.

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to build suitable airports that the post-war air age will be delayed.

The end of the war will bring us a long step nearer the accomplishment of the airplane's real purpose—the rapid transportation of commerce over the face of the globe. No other instrument

ever invented by man has a greater chance of creating international good will. Yesterday we were a world of separate nations, protected by distances that no longer exist and seas that have been narrowed to millponds. Today our nearness makes us all members of the Family of Nations.

Science News Letter, August 12, 1944

AERONAUTICS

Jet Propulsion for Gliders

May eliminate other methods of launching if it proves practicable. The one big disadvantage is the additional weight of the motor.

➤ JET PROPULSION motors may eliminate other methods of launching motorless planes or gliders, if this method proves practicable. Such a motor was tried out in conjunction with an address by Zbigniew Krzywoblocki, instructor at the Polytechnic Institute of Brooklyn, at a meeting of the Soaring Society of America in Brooklyn.

Mr. Krzywoblocki stated that successful powder-rocket flights had been performed with gliders as early as 1928 in Germany and in 1931 in Italy. No glider, however, has ever taken to the air with a jet motor.

Jet-propulsion motors might make it possible for gliders to take off from a level hilltop or from flat ground, and for horizontal flight, where no gain in altitude is required, without automobile, plane, or winch towing, or shock-cord launching. One big disadvantage of jet-propulsion motors for gliders is the additional weight of the motor.

The combustion chamber of the jet motor may be placed in the wings, and the fuel tanks may be placed in the wings or fuselage. Mr. Krzywoblocki pointed out that jet propulsion calls for an elaborate installation and is difficult to operate.

Zygmund Fonberg, consulting engineer, built the model jet-propulsion engine demonstrated at the conference. The engine, mounted on a restraining structure to prevent it from "taking off" was actually started and allowed to run for some time.

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Gliders Are Valuable

➤ THE SUCCESSFUL operation of motorless planes or gliders, in the airborne invasion of Normandy, as well

as earlier military operations, has established them as valuable tactical weapons of air warfare, reported Major Eliot F. Noyes, of the Army Air Forces, at the meeting.

"Beyond any doubt, the glider has now been accepted as a tactical weapon of great military importance. Gliders have now been used tactically in a variety of ways, but this is still a new weapon. The extent of its tactical possibilities is not known, and will not be discovered without further use in actual theaters," Major Noyes stated.

Military gliders, he indicated, were designed to carry troops and equipment into battle. The glider is a large container that can land in small unprepared areas in which a transport plane cannot land. It can carry larger loads of men or equipment than can be dropped by parachute. It can be retrieved either loaded or empty.

Most important use of gliders, Maj. Noyes advised, is the airborne attack, as used in the invasions of Crete, Sicily and Normandy. Large numbers of gliders are used, flying probably in darkness or half-light. Such an operation is designed to land troops who will vertically outflank the enemy, seize communications points and disrupt the enemy's rear lines, making it difficult for him to bring up reserves while a ground attack is in progress.

A second important use is the establishment of an airhead behind enemy lines, as was done in Burma by Col. Cochran's Air Commandos. The important difference between this and the Normandy invasion, Maj. Noyes pointed out, lies in the fact that in Burma the airborne force (*Turn to page 110*)

comprised the entire assault, penetrating 150 miles into Jap territory. It was not the mere sealing off of an area where ground or seaborne troops would later attack.

Gliders are also used by the enemy in airborne raid operations, Maj. Noyes went on. "The Germans' use of gliders has been mainly in raid operations . . . Mussolini was rescued by troops that landed from gliders, and the surprise attack on Marshal Tito's headquarters in Yugoslavia was again largely a glider-borne force."

Foreseeing new applications for the glider, Maj. Noyes pointed out that "... utility possibilities include the evacuation glider which carries wounded, and the various field dressing stations which can be neatly packed for delivery by glider . . . standard field kitchens which would enable one glider load to serve 150 men with hot food . . . portable radio detection stations and weather stations which can be carried with their crews to any point within flying range for special reporting missions."

"There is obviously no limit to these possibilities, and we may soon see all sorts of service units provided by glider to front line outfits such as shower units, clothing and shoe repair shops, refrigeration units, and so forth," he concluded.

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Better Powered Planes

► EXPERIMENTS made with motorless planes or gliders will result in the greater refinement of powered airplanes, Charles Gale, one of the founders of the Soaring Society of America, stated in an interview.

At the low speed at which a glider flies, the pilot can note many things about the design and construction of the plane which could not be readily discovered in a power plane travelling at high speed, Mr. Gale pointed out. An aeronautical engineer equipped with measuring instruments could determine in a glider flight under actual flying conditions facts that are only approximated by models in wind tunnels.

"Soaring as a sport will return after the war," he predicted, "and there is every indication that there will be commercial applications of the technique, equipment and practices which have been evolved through the use of military gliders."

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Five factories in the United States are now producing *helium gas*.



A Sick Sadness

► PRACTICALLY all orange, grapefruit and tangerine trees in the United States and other major citrus-growing countries may be seriously menaced by a disease that is already known in South America, South Africa and Java, and that may become world-wide. It has been carefully studied by Prof. H. J. Webber of the California Citrus Experiment Station at Riverside, California, whose report was published as a translation in Portuguese in Brazil before it appeared in English in the United States.

Although trees were dying of this disorder in South Africa 40 years ago, its serious nature was not recognized until it appeared in Argentina and Brazil. There it was given the name "tristeza," which in both Portuguese and Spanish means sadness or melancholy. Prof. Webber suggests this name as appropriate for general adoption.

Tristeza is one of the most baffling diseases which plant pathologists have ever studied. It affects only grafted trees, and then only one particular type of graft, wherein orange, grapefruit or tangerine cions are set on sour-orange stocks. Similarly grafted lemons remain unaffected. No virus or other disease germ has yet been identified as its cause, neither has any insect or other possible carrier been placed under indictment.

Sour orange, a wholly inedible species of citrus, has become the most widely used of grafting stocks because its roots are more resistant to certain soil harbored diseases than those of the commercially valuable species which are grafted on it. But if young orange, grapefruit or tangerine trees with sour-orange roots are set out in a tristeza-infested region, growth stops in two or three years and the roots die. Yet the

same species growing on their own roots show no sign of tristeza, nor do sour-orange trees that have been permitted to bear their own tops instead of the grafted-on cions.

Various theories have been proposed to account for the strange behavior of this disease. Prof. Webber's own theory is that the cause is a virus, which is held in check by some substance produced in the leaves of sour orange and lemon, but absent, or present in inadequate quantity, in the susceptible citrus species.

Tristeza has not yet been found in the citrus-growing areas of the United States or in the Mediterranean countries, but there is no assurance that it will not appear in either of these regions. If it does, total disaster can be averted by converting the orange groves into lemon groves by top-grafting, since lemon cions confer immunity. Diseased trees may also be saved by transferring them onto resistant stocks, such as the rough lemon: seedlings of the rough lemon are planted at the base of the old tree and their tops are grafted into the trunk of the diseased tree above the sour orange stock.

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INVENTION

Oat Flour in Ice Cream Improves "Eating Texture"

► AN ICE CREAM that ought to be popular in Scotland is the subject of patent 2,355,032, granted to Sidney Musher of New York. An essential ingredient is very finely ground oat flour, which the inventor states prevents the formation of objectionable ice crystals and at the same time improves the "eating texture" of the product.

Mr. Musher has also taken out several other patents on products incorporating oat flour, including one plastic.

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MATHEMATICS DICTIONARY

Invaluable in reading any book that uses mathematics.

The James Mathematics Dictionary

the only such book now published, provides standard definitions of the terms and phrases from arithmetic through elementary differential equations, the technical terms ordinarily used in the applications of these subjects, and more advanced basic terms. Easy examples, many illustrations and all sorts of formulas are included. The appendix contains tables of weights and measures, a list of mathematical symbols and tables ordinarily used in handbooks.

This dictionary is a great deal more than a collection of definitions. It explains, illustrates and correlates, stressing especially those operations that are hardest to understand. One reader has called it "Ten texts in one." Second printing of Revised Edition, just off the press. Blue fabric binding, for \$3.00, from the Digest Press, Van Nuys, California, or Science News Letter.