

ORNITHOLOGY

Grasshopper Sparrow Is Little Known Bird

See Front Cover

► THE TINY grasshopper sparrow, like the one on the front cover of this SCIENCE NEWS LETTER, is one of the commonest sparrows in the eastern part of the United States, yet it is one of the least known because of its seclusive habits and its thin, insect-like song. Its high-pitched song of "zee-e-e-e-e-e" can be heard for only a distance of several hundred feet. This song gives rise to the name of grasshopper sparrow.

It lives in old dry grassy fields and will not take wing until almost stepped upon. When it does fly, it seldom rises higher than a few feet above the ground. Its favorite singing perch is on a fence rail. Its nest is rarely found because it is cleverly concealed under the grass. The bird avoids giving a clue to the location of its nest by entering the area through a long and devious pathway in the grass.

The unusual photograph on the cover was taken by George A. Smith of Quarryville, Pa., by synchronized flash, and by remote control with a miniature camera placed within two feet of the nest.

Science News Letter, June 9, 1945

PHYSICS

Fiberglas Mats Valuable In Several Applications

► FIBERGLAS mats, developed originally for use in storage batteries, are now found to be valuable in several other applications. They are employed with success for wrapping underground oil, gas, and other pipe lines to protect them against electrolytic action and corrosion; as a base for a new plastic laminated material; and as a base material for gaskets and sheet packing. These mats are made by the Owens-Corning Fiberglas Corporation.

Glass fibers are non-corrosive to metals and have negligible moisture pickup. The mats of this material can be wrapped around bitumen or coal tar-coated pipe, thus forming a continuous water-tight bond. The tensile strength of the material withstands a wide range of temperatures, and exposure to organic solvents and soil acids.

The new plastic laminated material in which "fiberglas" is used, has many electrical uses because it possesses a low and stable loss factor over a wide wave frequency range. It is employed in plastic

coil forms, condenser spacers, stand-off insulators, and in radio, television and other high-frequency electronic devices.

In the base material for gaskets and sheet packing, the mat acts as a carrying medium for synthetic resins suitable for applications requiring resistance to heat, oil and acids. The gaskets show high pressure resistance, chemical durability and little flow under flange pressure.

Science News Letter, June 9, 1945

MINERALOGY

Industrial Diamonds Cut With Electric Arc

► CUTTING industrial diamonds with an electric arc, a new process just discovered at the National Bureau of Standards, increases the rate of cutting from double to four times that of present methods. The discovery is perhaps the greatest real advance in the technique of cutting diamonds since the art was first practiced hundreds of years ago.

Two scientists of the Bureau are responsible for the new method, C. G. Peters and Karl F. Nefflen. They find that they are able, with the electric arc method, to double the cutting rate when the cut is in the most favorable direction as regards the crystal axis, and to increase the rate about four times for the least favorable direction.

The electric arc is formed between the diamond and the cutting lap. Messrs. Peters and Nefflen connect the secondary terminals of a 5000-volt power transformer to the dop that holds the diamond and to the rotating lap. When an alternating current of 110 volts is applied to the primary of the transformer and the current adjusted to about half an ampere, a small blue arc is formed at the contact of the diamond and lap.

They have also found that by applying the arc to a diamond saw, the sawing rate is greatly increased, so that diamonds can be sawed regardless of the orientation of the cut with reference to the crystal axes.

The method for cutting plane surfaces or facets on diamonds, used universally since the earliest records, has been to place the stone in contact with a flat cast-iron lap charged with diamond powder and rotated at about 2000 revolutions per minute. As a general rule, cutting is most rapid when the plane of the facet is parallel to one or two of the crystal axes of the diamond and the direction of motion of the lap surface is parallel to one of the axes.

*Science News Letter, June 9, 1945***IN SCIENCE**

ORNITHOLOGY

Bright-Plumaged Birds Sent from Costa Rica

► THE NATIONAL Zoological Park in Washington has a good neighbor far off to the south, in the Central American republic of Costa Rica. He is Alejandro Caballero Gamboa, of San Jose, who has sent half-a-dozen of the brightest-plumaged birds ever received in the capital. The collection consists of one honey-creeper, a pair of blue-hooded euphonias, and two Costa Rican chlorophonias, and one bird as yet unidentified. Luis Maiden, a geographer now conducting field studies in Central America, acted as intermediary in transmitting the birds.

The National Zoo is also rejoicing in additions to two native North American families. There are two new cubs in the mountain lion's den, and two in the cage of the red fox.

Science News Letter, June 9, 1945

HORTICULTURE

Cornell Has Roses With Stems 20 Inches Long

► ROSES are sold by stem length—the longer the stems, the higher the price.

On this basis, Cornell University probably has the most expensive roses being grown, for the average stem length is 20 inches, as compared with 12 to 15 inches in the commercial trade.

The Cornell specimens also have from 35 to 40 flowers per plant, whereas commercial production averages less than 30 flowers per plant.

The reason lies in better fertilizer concentrations and close attention to watering. A higher soil moisture content is carried, for example, than in most commercial production.

The rose plants are grown in benches. No fertilizer is lost. Water that leaches from the soil is caught in the crocks and returned to the soil in the next watering. Thus the soil nutrients are saved and used again.

Many experiments on rose growing are underway in the floriculture department's greenhouses—on soil moisture, watering both by hand and by automatic methods, and nitrate studies.

Science News Letter, June 9, 1945

CE FIELDS

CHEMISTRY

Fuel Substitute Is Better Than Gasoline

► A NEW fuel substitute for gasoline that gives one-fourth more power in a properly designed internal-combustion engine is reported by Donald B. Brooks of the National Bureau of Standards. A blend of certain non-hydrocarbons, the fuel, if used in an ordinary gasoline engine may give up to 5% more power than gasoline, he stated.

The components of the new blend are ethyl alcohol, diethyl ether, acetone and butanol. These can also be used "straight" in some cases, Mr. Brooks stated. His conclusions are based upon tests of substitute motor fuels conducted in a precision single-cylinder variable compression engine in the Bureau's automotive laboratory at the request of the Foreign Economic Administration of the Office for Emergency Management.

Science News Letter, June 9, 1945

PSYCHOLOGY

Average Newborn Baby Cries 113 Minutes a Day

► THE AVERAGE newborn baby cries for 113 minutes a day.

This, according to an editorial comment in the *Journal of the American Medical Association* (June 2), "is more than should be necessary for the normal use of the cry as a signal of need."

The baby bawling was clocked in the nursery of a maternity ward by Dr. C. Anderson Aldrich of the Mayo Clinic and his associates.

The calmest hour of the nursery day, they found, is at 10 a.m.—a time when the nursery is fully staffed, the babies fully fed, and "the smaller needs of the infants were more completely satisfied."

The noisiest time comes between 10 p.m. and 2 a.m.—when there were only two student nurses to take care of 30 babies.

From this and other data on crying the physicians conclude that hospital routine and the distribution of nurses through day and night should be adjusted to the community needs of the infants.

Despite the offhand impression of parents of twins, it was found that crying

does not seem to be contagious from one baby to another.

"The chances are less than 0.14%," the doctors figure, "that more than half of the babies in the nursery will be crying simultaneously."

Science News Letter, June 9, 1945

HOME ECONOMICS

Cake Crumbs, Dried Fruit Make Sugar Go Farther

► CAKE CRUMBS and dried fruits can be used to make sugar supplies go farther. Honey, molasses, corn or maple sirup may be used instead of sugar in baking.

Extra juice saved from canned or cooked fruit may be used in sauce for puddings and fritters; to moisten and sweeten crumbs for brown betty and sweeten and add flavor to gelatin desserts, point out food specialists of the War Food Administration.

Crumbs saved from cake and cookies cut in half the amount of sugar needed for bread puddings.

Marmalade, jam or preserves spread on warm cake make an excellent substitute for cake frostings and fillings, which call for considerable sugar. Sheet cakes require only half as much frosting as layer cakes.

Fillings for pies, turnovers and tarts can be made with steamed dried fruit, rich in natural sugar. A good filling for layer cake is made of chopped dried fruit, mixed with nuts and moistened with honey or corn sirup. Fill baked apples or pears with raisins and sirup or honey instead of using sugar.

Fresh fruits should be served as dessert frequently, especially during the summer months. Fruit salad may also replace a sugar-consuming dessert.

A bit of salt, added to the cake frosting, pie filling or pudding, accentuates the sweetness. Less sugar is needed to sweeten cooked fruit if it is added after instead of before cooking.

Cornstarch or tapioca cream pudding may be made with half the usual measure of sugar if a tablespoon of sirup is put in the bottom of each serving dish before filling with pudding.

These hints will be especially helpful in feeding crowds at community picnics and large suppers this summer. Assembled by industrial feeding specialists of the War Food Administration for the use of chefs and dietitians in restaurants, cafeterias and hospitals, they will help your own sugar supplies last longer.

Science News Letter, June 9, 1945

ENGINEERING

Norden Bombsight Is Really Master Robot

► LONG one of the major secrets of World War II, the Norden bombsight is disclosed as a complex mechanism that rapidly shows the bombardier where and when to drop his bombs. In its operation it solves two problems in trigonometry, makes other mathematical computations, and finally takes over the job of the pilot on the bombing run.

The essential parts of the Norden sight are a gyro-stabilizer, computing machinery, and an optical system in which is installed a mirror attached to a variable speed motor.

In operation, the bombsight measures the rate of change between two imaginary lines, one of these lines is the equivalent of a plumb line hung from the plane. The other is the constant line of sight to the target, maintained by the mirror. The angle at which this mirror is tilted changes as the plane approaches the target.

By viewing the target through the sight, then setting the knobs which control the computing mechanism and switching on the automatic pilot, the bombardier is ready to drop his bombs. He does not necessarily have to keep his eye on the target once this is done, for a pointer, mounted on the sight, shows him the exact moment when he should drop his packages of destruction.

Science News Letter, June 9, 1945

INVENTION

Fire-Alarm System for Airplanes Insures Safety

► GREATER safety for air travellers of the future is sought in a new fire-alarm system, on which U. S. patent 2,376,920 has been issued to Harry S. Jones of East Orange, N. J. Rights in the patent are assigned to Thomas A. Edison, Inc.

Since any fire-alarm system intended for use on planes must endure a good deal of buffeting and exposure, the basic design must be simple. Mr. Jones' device meets this requirement; its basis is the well-known principle of the thermocouple, in which a pair of unlike metal pieces have their electrical properties changed by heat. A ring of thermocouples, connected by a cable, is secured to the firewall directly behind the engine. If a fire occurs, the current within this ring, stepped up through a relay, sounds the alarm.

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