

## *Insect Virtuosi*

THE ordinary little black cricket that chirps and chirps and nearly drives you to distraction when you want to sleep, is a more skilful fiddler than Fritz Kreisler or Jascha Heifetz. He can play a full-tone slur in a fiftieth of a second, and that on a pair of notes that a master-violinist can reach only by sliding his finger 'way down on the E-string. And he repeats the feat four times at every stroke of his bow.

Some of the musical secrets of these insect virtuosi have been discovered by Dr. Frank E. Lutz and W. R. Hicks, of the American Museum of Natural History. They assisted at the production of the first "talkie," or more accurately the first "chirpie," of a performing cricket that has ever been made. Afterwards they made a study, with a microscope measuring device, of the alternating shadows and clear bands on the edge of the movietone film that record and reproduce the sounds.

They found out some things, by sight, that the human ear is too sluggish to hear as sound when a cricket chirps. They learned that the insect does not slide the tiny file near the edge of his wing clear across the other wing-edge at one stroke to produce a chirp. Each chirp, as recorded on the film, separates itself into about four subdivisions, which Dr. Lutz calls "pulses," with imperceptible pauses in between. Each "pulse" lasts on the average a fiftieth of a second, and each pause somewhat less than that. But the human ear, because of its innate sluggishness, perceives the whole performance as a single sound.

A closer examination of a single "pulse" shows that it starts at the high pitch of fifth "D" above middle "C" of the piano keyboard. It rises momentarily a little higher, then slurs downward approximately a whole tone. And all in about a fiftieth of a second.

*Entomology*

*Science News-Letter, June 14, 1930*

## *Sorts Colors*

A NEW use for the photoelectric cell has been found in which the "electric eye" again proves its superiority to the human eye for comparing colors. Textiles of slightly varying shades are now classified by the photoelectric cell more expertly than can be done by manual operatives.

This cell is also the heart of television, it picks cigars of choicest

color, and warns when the exhaust smoke in Holland vehicular tunnel under the Hudson river becomes dangerous. Its new application was publicly demonstrated for the first time recently before the New York Electrical Society by the inventors, Dr. H. H. Sheldon and Dr. W. A. Schneider, physicists of New York University.

Dr. Sheldon explained that two cells are used which create a balanced circuit and hold a deflecting needle at zero when both receive the same amount of light. But when the color of the article under one cell is different from that of the article under the other, different amounts of light are reflected to the cells, different currents pass through them and the needle becomes unbalanced and swings away from zero. The needle will vary even when the shades look exactly alike to the human eye.

Error may be introduced by the effects of weave and sheen. Weave effect is overcome by rotation, which melts the pattern into one solid mass of color. Sheen is counteracted by the use of a spherical photometer in which light is reflected from the cloth in all directions so that a concentration of light at any one point is eliminated.

*Electricity*

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## *Old at 30*

"PARADOXICAL as it may sound, many a young girl of 29 in search of a job suddenly discovers that she is an old woman," Caroline Manning, of the Women's Bureau, U. S. Department of Labor, told the National Conference of Social Work, meeting this week in Boston.

Industry demands extreme youth, preferring to initiate girls 18 to 21 years into the running of its machines, feeding its presses and handling its telephone lines. Women of 25 years find it hard to get a job when a factory closes, as many cigar making plants have recently closed in order to open elsewhere as consolidated shops using machinery for the old hand tasks, Miss Manning showed. Women over 40 find the situation almost hopeless.

Employment is becoming increasingly precarious for women beyond 25 or 30 years, she reported. The need for scientific information as to what human beings of different ages can learn and accomplish was shown by the speaker, who said:

"Industry is acting upon the assumption that you cannot teach an

# IN VARIOUS

old dog new tricks, and has not used practical tests to demonstrate fitness for simple jobs. Nor has it proved that other qualities may not compensate for loss of speed.

"If a woman of 30 can learn to run an airplane, or if a woman of 50 can learn to drive an automobile, she certainly should be given a chance to demonstrate the fact that she can watch an automatic weighing machine, or pull the lever that starts or stops a wrapping machine, for such modern equipment demands little more than this from the girl who is merely the tender of a machine."

The maximum hiring age limit for women is now ten years lower than for men, Miss Manning reported.

*Sociology—Employment*

*Science News-Letter, June 14, 1930*

## *Emergency Power*

FOLLOWING the precedent set by the airplane carrier "Lexington" in supplying Tacoma, Wash., with emergency electrical power during the past winter, the "Jacona," a 7,000 ton merchantman built by the United States for war use, is being groomed at the Newport News Shipbuilding and Dry Dock Co., for permanent service as a transient power plant to coastal cities of Maine and New Hampshire.

Although two 13,400 horsepower turbine-driven generators are being permanently installed in the "Jacona," the vessel is to be used only in cases of emergency. She will be a steam auxiliary for use in time of drought and transmission line failure, the Central Maine Power Company, for whom the vessel is being reconditioned, explains.

Many small communities are furnished electricity by this company almost entirely from water power plants. Emergency steam generating equipment is necessary, but it is very expensive to have enough small steam plants in right places when drought comes or to build transmission lines for sending the power a great distance from a central plant.

The additional reserve capacity on shipboard which can be quickly towed wherever needed is expected to overcome both difficulties. The power company believes this plant aboard ship can be used twice as much as if it were fixed in one locality.

The turbines will take steam at 400

## SCIENCE FIELDS

pounds per square inch, a much higher pressure than in most plants. The boilers are to burn oil, but provision is being made for the installation of additional boilers whenever it becomes more economical to burn coal.

Because of close quarters and possible dampness on board ship, the 11,000 volt bus bars of the switching equipment will be insulated. In stationary plants they are nearly always left uncovered.

In spite of a decade of idleness the "Jacona" was found in very good condition. She is an oil burner 380 feet long, of 50-foot beam and 26-foot draft. All old machinery has been removed, but tanks beneath her false bottom and other tanks fore and aft are being left for water ballast.

*Electrical Engineering*

*Science News-Letter, June 14, 1930*

### Oil Safe

EVIDENCE that the refined mineral oils used medically will not cause cancer has just been reported to the American Medical Association by Dr. Francis Carter Wood of the Columbia University Institute of Cancer Research.

The fact that cancer frequently occurred in human beings as a result of contact with lubricating oils has caused considerable alarm among patients who were taking mineral oil for medical purposes. Dr. Wood's scientific experiments showed that there is no ground for this alarm.

Dr. Wood tested the effects of mineral and lubricating oils, both externally and internally, on white mice of a strain whose history and liability to develop cancer were known. Several well-known makes of medical mineral oil were used.

He painted the skin of the mice with mineral oil of the type used medically but no cancer developed. Then he painted them with heavy lubricating oil and produced a few tumors. Painting with tar produced both tumors and cancer.

Feeding both the mice and white rats with medicinal oil did not cause cancer of the gastro-intestinal tract.

The skin of the white mouse is quite as sensitive to oil irritation as the human skin, and both white mice and rats have spontaneous cancer of the intestines. Consequently if the refined oils used did not produce cancer

in these animals, there is no reason to believe that it will produce cancer in human beings, Dr. Wood concluded.

Incidentally he pointed out that petrolatum has been used extensively in recent years as the basis of medical ointments, as well as for internal medication, but no cancer has been reported as a result. Also a lighter grade of mineral oil has been used for nasal sprays without any evidence of cancer resulting.

These general observations, together with the scientific experiments seem to dispel definitely the fear of getting cancer from mineral oil of the type used for medical treatment.

*Medicine*

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### Engineering and Science

EVERY application of science presupposes a discovery of science to be applied, so that the useful applications of science are in the last analysis limited by the extent to which scientific research has been successful in uncovering the hidden forces of Nature."

With these words Dr. Karl Taylor Compton, formerly professor of physics at Princeton, upon the occasion of his inauguration as president of the Massachusetts Institute of Technology emphasized the importance of pure science to engineering. Dr. Compton continued:

"Then, when these scientific discoveries are put to the service of man, there is always a limit to the available extent of this service, a limit set by some such thing as a defect of material, inability to solve an equation, or some disturbing factor. So here again it is the province of research to push back or remove these limitations. While, therefore, in its humble beginnings, the greatest service of an institute of technology might very well have been to acquaint men with the laws of science and the technique of their application, an institute of technology today, to perform its greatest service, must take the lead in actually developing science and its applications as well as in technological instruction. In fact no proper or adequate teaching in these days can be done except as it is permeated with the spirit of research, for every constructive activity of life which is not mere routine consists of the continual endeavor to solve problems, in which broad training in fundamental principles and the inculcation of the true spirit of research constitute the best possible preparation."

*Engineering*

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### Mountain Building

ARE the mountains of the earth the result of enormous "puffs" of internal energy, coming at intervals of millions of years, after the manner of a teakettle lid being lifted by puffs of steam at intervals of a few seconds?

This suggestion, one of the "grand ideas" of geology, was put forth in a Columbia Broadcasting System radio talk by Prof. A. C. Lane, given under the auspices of Science Service. Prof. Lane is head of the geology department of Tufts College, consultant in science of the Library of Congress, and chairman of the National Research Council's subcommittee on the estimation of geologic time.

"It is a task for geologists to work out these cycles and see if they have about the length indicated—24 million years," said Prof. Lane. "There are numerous ways of so doing. For instance, as we tell the age of a horse by the wearing down of his teeth, so we can estimate the age of mountains. The younger mountains, the Himalayas and the Rockies, are higher. In the older mountains like the Appalachians and those around Lake Superior the folds have been bevelled off until it is literally true that the valleys have been exalted and the hills laid low. Estimating the load carried by the rivers we may estimate how fast this action has been going on. It has been estimated that 15,000 feet of strata have been removed from the region of the Rockies and the Grand Canyon of the Colorado in the last two periods at a rate of perhaps one foot in 3000 years. This would make the length of these cycles 45 to 60 million years. The thickness of the beds deposited may also be used to base an estimate."

*Geology*

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### Safer

INCREASES in transatlantic and coastwise shipping are causing the addition of half a dozen 12-ton buoys to the waterways of New York harbor. The installation is to be made during June by the U. S. Lighthouse Service, the Department of Commerce announces.

All the new buoys will display flashing lights and five will have bells. They will mark the channel from the Statue of Liberty and Governor's Island to the Narrows.

*Shipping*

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