

## ASTRONOMY

**Destructive Outburst  
Of Sun Believed Overdue**

**A** FLARING UP of the sun is overdue. That is a conclusion of an astronomical research by Dr. Conrad Lönnqvist of the Royal Observatory, University of Lund, Sweden, which is commented upon by a note in *Nature*.

From a study of novae, or "new" stars that became very bright suddenly, Dr. Lönnqvist estimated that on the average each star undergoes a nova outburst once in 400,000,000 years. Since the geological record of the earth shows that the sun has not experienced such an outburst in the last 1,000,000,000 years, the inference is that such an outburst of the sun may take place.

Any such outburst of the sun would, of course, destroy the earth.

There is a saving circumstance in the figures. The estimate of the time between outbursts of novae may be three times as great as it should be or only one-third of the correct figure.

Dr. Lönnqvist based his work on an earlier observation that the novae at maximum brightness have a constant magnitude of light.

The novae in the great Andromeda nebula were studied and the distance of the nebula was determined as 930,000 light-years, which checks with distance measures obtained at Mt. Wilson Observatory by use of the Cepheid variable stars. A similar method was used by Dr. Lönnqvist to deduce the distance of each nova from its apparent magnitude when brightest, and consequently to find the frequency of novae in a given volume of space, which can be compared with the estimated number of stars in that volume.

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## MEDICINE

**Conquest of Typhus  
Nearly Completed**

**T**HE LAST STEPS in the conquest of typhus fever are being taken in Washington, D. C., research laboratories and in Mexico. With the cause of the disease and the method of transmission known, scientists are working to perfect vaccines and serums that will give protection against it.

At the National Institute of Health in Washington, a vaccine has been made from typhus fever infected rat fleas, which protects guinea pigs from the disease and promises to develop into a

protective vaccine for humans as well.

In Mexico, a vaccine which should give lasting protection against the disease, and a serum which gives protection for a short time and which may be helpful in treating the disease, are being given to human subjects. These two, the vaccine and the serum, were developed by Dr. Hans Zinsser and associates at Harvard University.

Wholesale delousing procedures and war on rats have kept this ancient plague of filth and poverty in check in the past. But these measures are Herculean in difficulty. So disease-fighters are now pinning their hopes of controlling the disease on the development of a serum or vaccine that would be as useful as vaccination for smallpox or the protective serum for typhoid fever.

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## PSYCHOLOGY

**Traffic Problems  
In Museums Solved**

**W**HEN VISITORS enter museum doors, 75 per cent. turn to the right and start touring the exhibits. Only 25 per cent. bear to the left.

This bit of human psychology, which is of considerable importance to museum curators, has been pointed out by Prof. Edward S. Robinson of Yale University. Prof. Robinson checked up on the wanderings of museum visitors in an effort to aid museums in making their exhibits effective.

Museum curators were not generally aware that the public has its own indoor traffic rules, Prof. Robinson found. More often than not, exhibit cases were arranged to tell a continued story from left to right. This was because the curators laid out their exhibit plans on blue prints, and the eye moved most naturally from left to right.

In his psychological studies of museum labels, Prof. Robinson was able to show that interest in a picture could be increased 50 per cent. by skill in label-writing. The best labels were not what one would have guessed beforehand, he commented. Esthetic labels were unexpectedly appealing.

Prof. Robinson described his museum studies in a report to the American Public Health Association. The same objective measures of determining what is effective in museum halls can be applied to health education, he suggested. Experiments, he said, can provide objective standards of educational efficiency to replace guesswork and hunches.

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**IN SCIENCE**

## PALEOBOTANY

**New Fossil Species  
Of Sweet Gum Discovered**

**F**OSSIL prints of sweet gum leaves, with three points instead of the familiar five of the modern sweet gum tree species of the southeastern United States, have been found in Wyoming by Dr. Roland W. Brown of the U. S. Geological Survey. The rocks in which they were found were laid down as silts hardening into shales, during the Cretaceous period, last of the ages when dinosaurs walked the earth, perhaps a hundred million years ago.

Because the fossils were found in the banks of Fontanelle Creek, Dr. Brown has named his new species *Liquidambar fontanella*. His technical description will be published in *The Botanical Gazette*.

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## PHYSICS

**Ultra-Rapid Vibrations  
Decompose Carbohydrates**

**S**UGAR and starch are broken down into simpler compounds by ultra-sonic waves, which are vibrations similar to sound waves but much too rapid to be audible, states Prof. A. Szent-Györgyi, director of the Institute of Medical Chemistry of Szeged University, Hungary, in a letter to *Nature*.

Ultra-sonic vibrations, first described by the American physicists, Prof. R. W. Wood and A. L. Loomis, are obtained by the action of high-frequency radio waves upon a thin quartz plate, which transforms them from electro-magnetic waves into mechanical vibrations.

With vibrations having a frequency of 723,000 per second, Prof. Szent-Györgyi and A. Szalay found that cane sugar can be broken down to simpler molecules (monosaccharides) and the particles composing starch, gelatin and gum acacia can be broken down to smaller dimensions.

It is hoped that ultra-sonics will furnish a new method of measurement of the strength of chemical bonds which hold atoms and molecules together.

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# CE FIELDS

## PHYSICS

### Water Used Successfully Against Oil Fires

**F**IRE CHIEF Stein, of Magdeburg, Germany, dared to doubt the firm belief of all orthodox firemen that water must not be used to fight oil fires. Moreover, he backed up his own opinion with action, and proceeded to prove that water can be used, most effectively, to extinguish oil fires if properly applied.

The Stein method does not call for the addition of any chemical agents to the water, nor does it require elaborate equipment. The fire is not flooded with great masses of liquid water, which would merely spread the flames; instead the water is atomized through an adjustable nozzle which throws a cone-shaped jet of fine spray over the fire. In this form, which is much like a jet of steam but much cooler, a double fire extinguishing effect is exerted by the water; the air supply, essential to continued burning of the oil, is cut off, and the burning oil is greatly cooled because large amounts of heat are absorbed as the fine water droplets are suddenly evaporated into steam over the hot oil.

In a test fire, to prove the performance of the new method, a pool of about 250 gallons of crude oil was set on fire, and the flames were completely extinguished in a few seconds.

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## MEDICINE

### Secret of Cancer May Be Found in Glands of Body

**T**HE SECRET of cancer may be hidden in the glands of the body.

The most significant progress in the search for the cause of cancer is being made in laboratories where these glands are being studied, Dr. James Ewing, himself an eminent cancer authority and director of cancer research at Memorial Hospital in New York, told members of the American Society for the Control of Cancer.

No single agent or growth-promoting substance has been shown by these studies to be the cause of cancer. On the

contrary, the studies indicate that there is no single cause of cancer, Dr. Ewing said. Study of how these organs work in health and disease is most likely to reveal the cause of cancer of the organs, he suggested.

Cancers of certain glands secrete the powerful hormones of these glands, he reported. A specific test for one group of cancers, those of the sex glands, has been devised as a result of discovering a hormone substance in all these cancers. Reviewing all cancer research, Dr. Ewing concluded:

"There may be ever so many interesting chemical and physical processes going on in cancer tissues, but the whole subject takes on real meaning only when we learn that the entire play of forces is controlled by a hormone acting in very minute amounts."

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## METEOROLOGY-AERONAUTICS

### Prediction of Damaging Wind Gusts Sought

**U**NEXPECTED wind gusts, one of the greatest dangers facing airship operations today, are being studied by the Guggenheim Airship Institute in Akron, Ohio.

In the future when airships are walked from their hangar here the Institute officials hope to be able to forecast wind gusts. Thus if it were known that a gust was scheduled to arrive at the time of ground operations the crew would have the choice of two alternatives to avoid serious injury to the ship; either delay the operations till the passing of the gust or place more men on the side of the ship where the gust would strike.

The Guggenheim Airship Institute Building forms a triangle with the Goodyear-Zeppelin Airdock and the Akron Airport Administration Building, each side of this triangle being about a mile. At each of these stations, two instruments will be erected, one to determine velocity and the other direction of wind gusts.

Both wind velocity and direction instruments record by means of photoelectric cells. The cup anemometer rotates a slotted disk which varies a light falling upon the photoelectric cell which is connected to a recorder. The turning of a weather vane similarly varies light playing upon another photo-cell and allows an automatic record. Records will be automatically plotted.

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## INVENTION

### Metal Blackboards Made For Use in Schools

**S**HEET METAL blackboards, with a vitreous porcelain enamel surface, may replace slate in schoolrooms, with the invention in Grand Rapids, Mich., of a metal blackboard declared to be one of the most practical innovations since slate boards were adopted for classroom use in 1863.

Substitutes for slate board have been sought for years. Etched glass, fiber board, composition board and painted wood have been among substitutes suggested. The steel blackboard was conceived by R. S. Conrow, Middletown, Ohio, and perfected for commercial production in the laboratories of a school equipment concern.

Vitreous enamel is applied to ingot iron sheets in manufacture and an acid bath used to remove the sheen of the enamel. The paint is applied under vibration to insure a smooth surface. A method of joining panels together with a flat joint through interlocking fingers on the back, and a way of firing a curvature into the board so that it will cling to a wall surface have been worked out.

In laboratory tests, 24,000 chalk marks and erasures were made on one spot in the metal blackboard, without hurting the surface. The same test wore a hole in slate an eighth of an inch deep. The metal blackboard is said to weigh only half as much as one made of slate, to have a permanent color, not to be affected with cleansing fluids, and to be rustproof.

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## PHYSICS-MEDICINE

### 800,000 Volt X-Ray Tube To Treat Cancer

**C**ANCER will soon be treated at Mercy Hospital, Chicago, with a giant X-ray tube, with a voltage of 800,000 and a radiation output equivalent to radium worth \$75,000,000.

The new tube comes from the General Electric laboratories in Schenectady. It has several times the energy rating of the cancer treating tube installed about two years ago in Memorial Hospital, New York.

The tube itself is 14 feet long and it is being installed in such a manner as to assure the comfort and safety of patients and the hospital staff.

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