

PHYSICS

German Microphone Used To Detect Enemy Planes

➤ ANOTHER GERMAN device for detecting approaching airplanes is now revealed. It is a hot-wire microphone, said to be superior to the older electrostatic and electromagnetic types.

This microphone is for use on patrolling aircraft. Unlike other types it does not pick up mechanical vibrations produced by the carrier plane. It is particularly sensitive for sound waves between 50 and 250 cycles per second. With higher cycles its sensitivity decreases considerably.

The microphone looks like a slender projectile about eight inches long. The sound waves enter the microphone by means of six slotted openings at right angles to the throat of a resonator and to the main axis of the device. The throat contains a platinum wire heated by a battery power unit. The temperature of the wire varies with the changing pressure of the sound waves on it. The change in temperature alters the amount of power the wire draws from the battery. A meter indicates the presence of a train of sound waves.

A report on this hot-wire microphone, "A Microphone of the Hot Wire Type," prepared by a British investigator, may now be obtained from the Office of Technical Services, U. S. Department of Commerce, for one dollar. Its 10 pages include diagrams and graphs.

Science News Letter, April 5, 1947

MEDICINE

Cancer Kills Almost As Many Men as Women

➤ THE NOTION that cancer is primarily a woman's disease is false, the American Cancer Society states. In 1946, it is estimated, cancer killed 87,777 males and 93,723 females in the United States. The difference is only 6%.

The reason many people think of cancer as a woman's disease is probably because of the large amount of cancer in the female sex organs. Cancer of the uterus accounts for 19% and cancer of the breast for 18% of the cancer deaths in women. While cancer of the breast can occur in men, it is relatively rare.

When it comes to cancer of the stomach and digestive system, male deaths outnumber female by about 7,000 each year. U. S. Bureau of Vital Statistics reports for 1944 show 42,351 deaths among

men from cancer of the digestive system as compared to 35,637 among women. Finally, more men than women die of cancer of the skin, mouth and pharynx, lungs, nervous system, urinary tract and other sites.

One-fourth of the people attacked by cancer are saved by treatment with radium or X-rays or surgical operations. Another fourth die, but could be saved if the cancer were detected early and promptly treated. One-half of the people who meet with cancer, states the American Cancer Society, are dependent on new discoveries looked for from development of research. During this month the Society will put on a campaign to raise \$12,000,000 to support research, education and service for the fight against cancer.

Individuals should continue to make their own fight against cancer by consulting a doctor promptly if they have any of the symptoms that might mean cancer, such as unusual bleeding, persistent indigestion, persistent hoarseness, lump in the breast or unusual appearance of the breast, and a sore that does not heal promptly.

Science News Letter, April 5, 1947

BOTANY

White Pines Are Growing In Guatemala and Mexico

➤ WHITE PINES, usually thought of as distinctly northern trees, have recently been found growing on mountainsides in the tropics. Prof. Aaron J. Sharp of the University of Tennessee reports two communities of white pines in the mountain ranges of Guatemala, at elevations above 4,300 feet. Another group had previously been reported from Chiapas, southernmost Mexican state, by a Mexican botanist, Dr. Maximino Martinez.

Except for a slight difference in leaf structure, which marks them as a distinct variety, the trees are identical with the species *Pinus Strobus*, in which they are included, which reaches its southernmost known limit in the high mountains of northeastern Alabama and Georgia.

Prof. Sharp states that the two stands of pines he studied in Guatemala were associated with a number of other species of definitely northern aspect, such as boxelder, sweetgum, black cherry, sugar maple, oak, ash, elm, wild grape, dogwood, and several ferns familiar in the United States.

Science News Letter, April 5, 1947

IN SCIENCE

ASTRONOMICAL PHYSICS

Astronomers' Methods Aid Rocket Study Techniques

➤ TECHNIQUES used by astronomers studying the sun and other heavenly bodies are helping rocket studies, aimed at producing a missile superior to the Nazi V-2.

Problems which astronomical methods are helping solve for General Electric engineers studying rockets are how to take the temperature of rocket gases too hot for conventional instruments, and how to measure the velocity of the gases.

Adapted from the astronomers' measuring methods for the heat of distant stars and the speed of the sun's rotation, means of gathering information on the performance of rockets have been developed which will help in the design of more efficient motors and fuels.

Temperature of the rocket gases is taken by study of the wavelengths of molecular radiation. The light of the rocket flame is turned into a spectrum by means of lenses and prisms. Energy released by hydrocarbon molecules is recorded on a photographic plate and interpreted by means of a micro-densitometer, an intricate photoelectric device. In the V-2 rocket, the temperature of the gases is approximately 3,500 degrees Fahrenheit. Astronomers in the past have used a similar method to take the temperature of a comet's tail.

Wavelengths of the radiation from sodium atoms in the flame are photographed, using two periscopes, to help determine the velocity of the gases. Speed of the atoms approaching and leaving in the exhaust of the rocket are compared with stationary sources to calculate the velocity.

Basis of the speed determination procedure is the well-known Doppler effect, which uses the speed of an object toward or away from a certain point. Velocity of the superheated gases is compared with the velocity of light, as astronomers have calculated the speed of the rotation of the sun.

Dr. Francis P. Bundy and Dr. Herbert M. Strong, research physicists, devised the rocket test methods.

Science News Letter, April 5, 1947

E FIELDS

VETERINARY MEDICINE

Blood Bank for Animals Provides for Transfusions

► A BLOOD BANK for horses, cows and dogs is operated at the State College of Washington as an aid to valuable animals that may become seriously sick, also as material for research in veterinary medicine.

Blood is collected, preserved and transfused by methods adapted from human medical practice. Animal donors are lightly anesthetized before blood is drawn from their veins, and great care is exercised to avoid draining too much from any individual. The blood is kept as whole blood until it is too old to be useful as such; then its plasma is withdrawn and preserved.

The animal blood bank had its inception not long before Pearl Harbor, but little has been made public about its work until now. It is maintained by successive groups of senior students, under the direction of Dr. J. E. McCoy.

Science News Letter, April 5, 1947

DENTISTRY

Daily Lemon Juice Dose Etches and Destroys Teeth

► DAILY LEMON juice drinking destroys the teeth, two dentists at the Mayo Clinic in Rochester, Minn., warn. The dentists are Drs. Edward C. Stafne and Stanley A. Lovestedt.

They report on 50 patients who were taking lemon juice as a health measure and who also showed evidence of their teeth having dissolved away. In one case the upper front teeth were destroyed to the gum line. This was a man who for years had drunk lemon juice in water on arising.

Of the 50 patients, 39 were women and 11 were men. They came from 22 states, two Canadian provinces, Mexico and Puerto Rico, suggesting that the use of lemon juice as a health measure or a remedy is widespread.

The use of lemon juice was most common among sufferers from rheumatism. It was also used by some of the 50 for treatment of constipation, to prevent and relieve colds and occasionally as a tonic.

In most cases the destruction of the teeth was found in a general physical examination, but in a few the dental defect was the reason the patient came to the clinic.

The etching and decalcification of teeth by the action of the acid in lemons has been noted long ago, but until recently this was limited to certain peoples and geographic regions. Now that lemons are widely available, they are being consumed to a much greater extent. Because of their vitamin C content, this has been a help on the nutritional score, the dentists point out. They state, however, that enough vitamin C can be got without resorting to improper use of lemons. By improper use they mean: 1. sucking on lemons, which is not very common; 2. taking lemon juice daily in appreciable concentration.

Science News Letter, April 5, 1947

OPHTHALMOLOGY

New Methods Find More Congenital Cataracts

► THE NUMBER of known types of congenital cataracts, which are to be found in every human eye, has been greatly increased in recent years by new scientific methods.

Increase in knowledge of the different types of congenital eye abnormalities has been made possible largely by the development of the slit-lamp and the corneal microscope for study of the dilated pupil, says Dr. Frederick C. Cordes, professor of ophthalmology in the University of California Medical School.

Most congenital cataracts are stationary and cause no interference with vision, many individuals never realizing they exist. Some such cataracts are simply dust-like opacities in the eye.

However, in 50% of cases there are other ocular disturbances, such as dimness of vision and involuntary movement of the eyeballs, Dr. Cordes states.

Some cataracts have a hereditary tendency, while others may be caused by injury, infection or toxic substances administered during pregnancy. Vitamin deficiencies in the mother and interference with her calcium metabolism can also cause cataracts.

"A clear lens, one in the sense of a good photographic or microscope lens, is probably non-existent in the human eye," Dr. Cordes states. "Practically all lenses, even those of young children, show some dust-like opacities."

Science News Letter, April 5, 1947

BIOLOGY

Single-Celled Animals Affected by Insecticide

► BENZENE HEXACHLORIDE, the new British insecticide, has strange effects on the single-celled citizens of the microscopic world, Dr. Ll. Lloyd of the University of Leeds has discovered. When paramecia, normally neat little slipper-shaped swimming animals, are kept in water containing the poison in dilutions of from one to ten parts per million, they lose their power to divide and form new individuals. Instead, they slowly grow larger, until they are 50% longer and broader than normal. After a while the poison finishes its work, and they die.

Freak forms have also been observed in some of the lower-strength solutions. Here the cells apparently have not entirely lost the drive for cell-division, but they cannot complete it, and produce "Siamese-twin" animals. If some of these doubled forms are placed in clear water, a veritable frenzy of cell-division takes place, with animals, and even separated parts of animals, produced in all sizes and a wide variation in abnormal numbers of body parts.

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ENTOMOLOGY

Insects' Shell Tanned With Exposure to Air

► WHEN YOU are spading up your spring garden you are very apt to turn up numbers of brown beetles and other insects with their shells still unhardened. Leave them exposed to the air for a while, and their shells will take on the stiffness you expect in insect bodies.

Chemically, this process is very similar to the toughening that takes place when raw hide is tanned into leather; proteins are acted upon by an acid and made harder and more impervious. The chemical nature of the hardening of insects' outer shells has been discovered by three Cambridge University zoologists, Drs. M. G. M. Pryor, P. B. Russell and A. R. Todd, who report on their investigations in *Nature* (March 22). In the insects which they have analyzed, the hardening agent has proved to be a complex compound based on dihydroxybenzoic acid linked with either acetic or lactic acid.

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