

## MEDICINE

**Cancer Fight Helped  
By Mirror Microscope**

► **CANCER** fighting is now being done with mirrors, lenses, and invisible ultraviolet and infra-red light rays. They are being used, in special microscopes, for seeing more of what goes on inside the cancer cell, what special chemicals it needs for its diet, and what chemical changes in normal cells may be linked to the start of cancer.

A new microscope lens for this kind of cancer fighting, developed by David S. Grey of the Polaroid Corporation, was demonstrated at the meeting of the American Cancer Society in New York. Development of lens was sponsored by the Office of Naval Research. It is being manufactured by Bausch and Lomb Optical Company and is already in use at two research centers.

Science News Letter, November 5, 1949

## CHEMISTRY

**Warlike-Like Aerosol Bomb  
Has Many Peacetime Uses**

► **THE** aerosol bomb, which acquired fame during the war because of its effectiveness in killing insect pests, in a modified form is now serving the civilian population in applications ranging from paint sprayers to fire extinguishers, and even for dispersing whipped-cream to tasty foods.

The civilian bomb is a low-pressure type. The wartime insecticidal bomb was a high-pressure affair, and costly because strong containers were needed. Low-pressure containers are cheap enough to discard after use. They work on the same principle, however, being compressed-gas containers. Aerosol is a scientific term for a suspension of fine particles in the air.

Reports on aerosol research, and a list of trade-literature on low-pressure aerosols, designated as D1 and D2 respectively, are now available from the U. S. Department of Commerce, Office of Technical Services. Requests for them should include the "D" designation. A bibliography of published references on aerosols may be obtained from the Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture. As insecticides, aerosols have practically revolutionized such fields as green house culture, it is pointed out.

Science News Letter, November 5, 1949

## GENERAL SCIENCE

**"Dimpled" Golf Balls  
Give Longer Drives**

► **DIMPLES** in your golf balls give you a longer drive and better control over where the ball will go. Golfers may have claimed this for a long time, but now the scientists have proved it is so.

Spinning golf balls dropped through a wind stream were studied by John M. Davies at the B. F. Goodrich Company wind tunnel in Akron, Ohio. Driving tests by a machine that hit the ball with a mallet-type club were also made, giving results which were consistent with the wind tunnel tests.

Smooth, mesh, standard dimple and bramble (protruding dimple) balls were tested by dropping them through a wind stream where the air had a speed of 105 feet per second. Height of the fall was varied from a little over one-half foot to somewhat under one and one-half feet.

Values of the drag and lift which determine the path of the ball, were obtained by spinning the balls first in one direction then in the other. These showed the effects of dimple and mesh markings to be very similar.

Club speed and face angle of the mallet-type club were varied for the different types of balls. For the dimple balls, the distance the ball covered and the flight path varied with the club face angle as might be expected. With the smooth balls, however, neither the distance nor the flight path of the ball changed much with the mallet variations.

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## GEOLOGY

**Coal Reveals Plant Cells  
In New Microscope Method**

► **A NEW** method of preparing specimens for the electron microscope reveals the cell structure of the ancient plants that went into the formation of coal.

The new technique consists in taking a plastic impression of the surface of a polished cube of coal, and then photographing the impression through an electron microscope. The older technique of peeling or slicing thin sections of coal gives specimens which are too thick for profitable study. The plastic replicas are about one-tenth of a micron, the desirable thickness.

Outlining the method in *ECONOMIC GEOLOGY* (Nov.), J. T. McCartney of the Pittsburgh station of the U. S. Bureau of Mines says that the coal cubes, about the size of large dice, are polished and then placed briefly in an etching bath of chromic acid-sulfuric acid. After washing and drying in filtered air, they are dipped in a solution of polyvinyl formal. Over this a second layer of film, nitrocellulose, is applied. When dry, the double film of polyvinyl formal and nitrocellulose is stripped off. This film, bearing an impression of the coal's surface structure, is photographed through the electron microscope.

Dr. McCartney believes that these studies will reveal more clearly some of the finer details of coal structure that are not yet fully understood.

Science News Letter, November 5, 1949

**IN SCIENCE**

## PHYSICS

**Reveal Plastic Film that  
"Combs Out" Heat Waves**

► **INVENTION** of a plastic film that "combs out" heat waves and allows their use in secret signalling and enemy detection was revealed to the Optical Society of America meeting in Buffalo, N. Y., after six years on the military secret list.

A research team from Polaroid Corporation, consisting of R. P. Blake, A. S. Makas and C. D. West, told how they developed during the war this first polarizer for infrared rays in convenient sheet form. Applications in scientific research and industry are expected for this simple polarizing device for the long invisible heat waves. Cumbersome reflecting plates were used previously.

Film polarizing visible light is made in large quantity and has many applications, including sunglasses that screen out scattered light causing glare. The heat-rays orienting film is made by combining two treatments used in making two types of polarizing film for visible light. A polyvinyl alcohol plastic stretched to align its molecules is first treated with iodine and then dehydrated.

The film makes "optical slots" that let the rays pass in one position and shut them off when turned at right angles.

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## ENGINEERING

**Quarry Rock-Blasting  
Better with Timed Delays**

► **ROCK** blasting in quarries is found to give improved breakage, less vibration and to decrease claims for damages when the explosions follow one another in a tiny fraction of a second rather than occurring at the same instant.

This new system of blasting was explained to the National Safety Congress in Chicago, by D. M. McFarland, Atlas Powder Company, Wilmington, Del. The split-second delay blasting, he said, is meeting ever-widening acceptance in the industry because of the improved results it offers.

The introduction of millisecond delays, he said, in addition to improving breakage and backbreak in multiple row quarry blasts has also produced a noticeable decrease in the noise from such blasts and vibration effects were diminished. The system is suitable for use in mining, in his opinion, but miners will have to be taught its advantages and how to use it before it can come into general use.

Science News Letter, November 5, 1949

# E FIELDS

## MEDICINE

### Housing in Oak Ridge Greater Threat than Bomb

► THE health of workers at Oak Ridge, Tenn., was more endangered by poor housing conditions than by the atom bomb.

A study which revealed a five times greater rate of meningitis, serious brain and spinal cord disease, among people living in the hurriedly constructed homes on the project, was reported in New York. It was conducted by Dr. Bernard M. Blum, director, the Fife-Hamill Memorial Health Center, Philadelphia, and William F. Elkin, statistician, health physics division, Oak Ridge National Laboratory.

Meningococcal disease was 14 per 100,000 population among persons living in standard housing but increased to 79 per 100,000 among people in sub-standard housing or slums, Dr. Blum told the American Public Health Association.

Negroes were stricken more often than white people, 174 per 100,000 as against 64 per 100,000. This confirms the findings of other studies showing their greater susceptibility.

Men were found almost three times more liable to be attacked by the disease than women, although the difference in rate was smaller between boys and girls.

Dr. Blum attributes the greater exposure to chilling and fatigue among the adult men workers for this difference.

The study was made to find the effect of the slum areas on the rate of meningitis. Oak Ridge was especially suited for the study because inhabitants of the slum areas were often people of professional standing and not necessarily in the low income bracket. This revealed that their health was dependent on their environment rather than on their economy.

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## AERONAUTICS

### Pre-Heat System in Plane Engine Beats Arctic Cold

► FAR-BELOW-zero weather failed to prevent easy engine starting on an Air Force Boeing B-59 Superfortress with a special self-contained engine pre-heat system in recent cold weather tests in the Arctic region, it was revealed by the Boeing Airplane Company, Seattle, Wash.

To adapt the giant plane for operation in extreme low temperature, several modifications were made. In addition to the engine pre-heat system, cold-starting accessories, a new oil dilution system and many other refinements were made. Included in

the installation were 640 separate thermocouples, electrical thermometers, to record temperatures in all parts of the plane.

Principal modification was the use of the plane's standard combustion-heater wing anti-icing system to pre-heat all four engines prior to flight. This was accomplished by covering the propeller hubs and cowling entry ducts and diverting the hot anti-icing air into the engine compartments. When the engines reached a temperature for normal starting the covers were removed by ground crews.

The new oil dilution system employed was designed to prevent pump failures during the cold starts. Gasoline used to dilute the oil at low temperatures evaporates and is filter-removed from the system within ten minutes of engine starting. The thermocouples used kept an accurate record of temperatures at such locations as oil and hydraulic tanks, wing, body and engine nacelles. They also recorded temperatures in crew-carrying compartments.

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## MATHEMATICS-ENGINEERING

### Zero Location Important In Electronic Problems

► WHETHER or not your telephone connection shrieks like a wild banshee, or a radar gun-pointer goes completely off its rocker and shoots friends instead of enemies, all depends upon the location of "zeros".

A new book to help engineers and scientists to cope with the crucial problems of "stability" of electrical, electronic, and mechanical devices has just been brought out by Prof. Morris Marden of the University of Wisconsin in Milwaukee, and published by the American Mathematical Society, New York (\$5.00). Since Prof. Marden's book stresses the location of the zeros, it has the title *THE GEOMETRY OF THE ZEROS OF A POLYNOMIAL IN A COMPLEX VARIABLE*.

What matters is the location of these zeros, the "roots" of the polynomial equation that describes the device in question. For instance, in a telephone system, if the zeros are all to the left of the central axis when plotted out in the complex plane, then the telephone amplifiers will amplify the voices instead of going into an uncontrolled howling.

The book is expected to be important to engineers and applied mathematicians who have to work with all sorts of control mechanisms and "feed-back" circuits. For them and for the general mathematical reader, it will collect results in this important field—which is 115 years old, and still rapidly developing—into one convenient book. By getting the important results all in one place, the book is expected to help avoid future duplication of old work, a serious problem in science, and to facilitate further progress in this field.

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## MEDICINE

### Vitamin E May Stop Blindness in Early Babies

► VITAMIN E is showing promise of checking a disease causing blindness in premature infants, Drs. William Councilman Owens and Ella Uhler Owens, of Johns Hopkins University Medical School, Baltimore, Md., told the American Public Health Association in New York.

The blinding disease is retrolental fibroplasia and is similar to congenital cataract but differs from it in that there are blood vessels in the membrane film located behind the crystalline lens of the eyes.

Drs. Owens found that the disease strikes about 15% of infants weighing three pounds or less. Earliest signs of the disease appear when the babies are about four weeks old and the disease process is usually complete by the time they are four months old.

Although the cause of the disease is still unknown, Drs. Owens believe it may be tied up with metabolism. They reason that when the first signs of the disease appear it is at a time when the infant, due to physiological immaturity, may be unable to meet the body's nutritional requirements from the diet he gets.

Premature babies are usually given vitamins A, D, and K to supplement their dietary needs. Drs. Owens have added vitamin E to their diets, beginning the first week after birth with very encouraging results. However, they caution, there is no successful treatment once the disease has taken hold.

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## VETERINARY MEDICINE

### No Record of Russian "First" on Cattle Vaccine

► SCIENTISTS in Washington have searched the literature in vain looking for the name of the Russian who Moscow claims produced the first foot-and-mouth disease vaccine.

Modern vaccine, like that being used in the current campaign against the disease in Mexico, is based on work done by Sven Schmidt of Denmark and Otto Waldmann of Germany in 1937 and 1938. Experts on the cattle disease failed to find any reference to an earlier Russian discovery in the U. S. Department of Agriculture library.

The only clue to the basis for the Russian claim is the fact that the Isle of Rheims off the German Baltic coast where Waldmann pursued his researches is now part of the Russian-occupied zone. One scientist suggested the possibility that Russia is exercising "retroactive dominion" over the scientific work done on the German island. Waldmann himself is now living in Argentina.

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