

## CHEMISTRY-AGRICULTURE

**Water-Repellent Soil in Florida Groves Explained**

➤ A BAFFLING soil condition of the Florida citrus groves that produces the equivalent of drought despite adequate rainfall has finally been explained.

The water-repellent soil, which "remains dry even after prolonged rainfall," is formed from magnesium used in fertilizer and an undetermined fatty acid in the soil, I. W. Wander of the Citrus Experiment Station, Lake Alfred, Fla., reports in *SCIENCE* (Sept. 23). Citrus trees growing in this soil are unable to get the water, which they need in moderately large quantities. As a result yields of oranges, lemons, limes and grapefruit fall off considerably, just as they would under drought conditions. Since "water repellency is widespread and quite pronounced in much of the citrus-growing area of Florida," both fruit growers and soil technicians consider it a matter of considerable economic importance.

The magnesium and the fatty acid form an insoluble substance that is almost identical with hard soap made in the laboratory. Soil experts who have not themselves experimentally verified the results advanced by Dr. Wander, find that they accord very satisfactorily with the known facts. They point out, however, that they give rise to an awkward situation. Obviously if magnesium were not used as a fertilizer, the formation of water-repellent soil would not occur. But magnesium is used very deliberately to supply a mineral which the soil lacks and which the fruit trees need. In spite of this, they believe that Dr. Wander's explanation will prove to be the first step in a solution of the problem.

*Science News Letter, October 1, 1949*

## CHEMISTRY

**Tungsten Filament in Bulbs Has Its Name Changed**

➤ YOU may think that there is a tungsten filament in that incandescent lamp bulb you read by, but you are wrong. It is a wolfram filament.

By international action, the name of the metal and chemical element, tungsten, has been changed to wolfram, by which it has been known generally outside the U.S.A. The symbol already was W.

This is one of six changes from American usage in element names that were made at the International Union of Chemistry meeting held last month at Amsterdam and reported to the American Chemical Society meeting in Atlantic City, N. J.

Niobium replaces columbium, but beryllium is now official for the world instead of glucinium, a European usage. Lutetium is chosen over lutecium and protactinium over proto-actinium. Hafnium is also given approval.

Two elements discovered in atomic fission products have had their names respelled: Technetium for element 43 and promethium for element 61, which were spelled -ium.

Six other elements discovered during atomic bomb research have had the names given them by their American discoverers made official internationally: Astatine for 85, francium for 87, neptunium for 93, plutonium (from which atomic bombs are made) for 94, americium for 95 and curium for 96.

The United States was represented by Dr. Edward Wickers of the National Bureau of Standards on the commission on atomic weights and by Dr. Alexander Silverman of the University of Pittsburgh on the commission on inorganic nomenclature.

*Science News Letter, October 1, 1949*

## OPHTHALMOLOGY

**TV Fatigue May Be Boon In Eyesight Protection**

➤ TELEVISION fatigue may be a "sight conservation boon," Dr. Benjamin Rones, eye specialist physician of Washington, D. C., declares in the *SIGHT-SAVING REVIEW* published by the National Society for the Prevention of Blindness.

Serious eye diseases will be discovered earlier, when treatment will give better results, if TV fatigue leads people to seek medical attention earlier, Dr. Rones thinks.

*Science News Letter, October 1, 1949*

## PSYCHOLOGY

**"Rock a Bye Baby" May Delight Some, Irk Others**

➤ PSYCHOLOGISTS have disagreed about whether you should rock and caress the baby. The baby's side of the argument was presented before the American Psychological Association meeting in Denver, Colo., by Dr. Helen M. Wolfe, of the staff of the Association.

The child does not always want to be petted, Dr. Wolfe told the meeting. But there is little that he can do about it until he is big enough to escape in some way.

At the very earliest ages, he can cry if held too tightly, and he does so. A little later he can try to disengage the hands which are holding him.

But the child finds it difficult to escape until he can run fast, hit hard or use names.

If you insist on cuddling the baby when he is trying to get away, don't be surprised if he bites, hits or kicks you, Dr. Wolfe warns.

If you must pet him, try offering some activity with your caresses such as patting games, tossing, singing, and so on.

And you will find that he will put up with your attentions more readily when he is sleepy.

*Science News Letter, October 1, 1949*

**IN SCIENCE**

## BIOCHEMISTRY

**Green Chemical In Blood Studied**

➤ A "BEAUTIFUL green" chemical exists in human blood. It may be involved in stopping the deadly action of poisons such as that from tetanus germs, cause of lock-jaw.

The name of the green chemical in blood is verdoperoxidase. It is found in the white cells of the blood which play an important part in the body's defense against germs and their poisons.

Verdoperoxidase, as chemistry students will recognize from the last part of its name, belongs to the class of chemicals known as enzymes. Most familiar enzyme to the layman is the pepsin of the digestive juice.

The green enzyme is one of three known to be in blood cells. Search for more knowledge about the known and unknown but suspected blood enzymes is going on in several laboratories, Dr. Britton Chance of the University of Pennsylvania School of Medicine told a conference on the National Blood Program of the American Red Cross in Washington.

The blood Americans give generously to the Red Cross for this program can be made more useful for saving lives and restoring health when scientists know more about its enzymes.

*Science News Letter, October 1, 1949*

## METEOROLOGY

**Rain Has Little Effect On Calming Stormy Sea**

➤ RAINDROPS produce only "splash and surface effects" upon the sea, they do not calm it, scientists have found.

E. W. S. Ashton and J. K. O'Sullivan of the engineering department, University of Manchester, Manchester, England, found that from a great height a drop of rain splashes and spreads and thus has little effect in calming a stormy sea.

By dropping aniline dye drops into a glass-side vessel full of water, it was found that the lower the height from which they fall, the more likely they will be to transfer their momentum from the surface layers to the underneath layers.

From 26 feet, however, the drop appears to spread over the surface of the water, thus dissipating its energy. Consequently, the stored-up energy of the individual drop coming from a great height dissipates in shock and splash at the surface, they report in the journal, *NATURE* (Aug. 20).

*Science News Letter, October 1, 1949*

# E FIELDS

## CHEMISTRY

### Make Quartz Crystals That Improve on Nature

► QUARTZ crystals better than Mother Earth herself can make have been produced artificially in Bell Telephone Laboratories, the American Chemical Society meeting in Atlantic City was told.

Needed during the war and in peace in order to convert mechanical energy such as sound into electrical energy, essential in many devices including the telephone system, large synthetic quartz crystals will protect the nation against a shortage of natural crystals in case of another war.

The American development is based upon work done by Prof. R. Nacken of the University of Frankfurt during the war. The quartz is produced in solid crystalline form from liquid solutions at high temperatures and pressures. The method used is much like the growing of rock candy crystals from super-saturated sugar solution, except that the process is carried out at high temperature and pressure in a thick walled steel tube. The liquid used is a strong alkaline solution which dissolves silica, the compound of which quartz is composed.

The artificially grown quartz is clearer and freer from imperfections which are always found in natural quartz. Growth rates as much as a tenth of an inch in length during the day are possible.

Science News Letter, October 1, 1949

## ENGINEERING

### New Magnetic Tape Records Data in Flying Rockets

► A MAGNETIC metal tape six inches wide and 150 feet long, for installation in the nose of a guided missile to record data as the craft penetrates the atmosphere miles above the earth, was revealed by United Aircraft of East Hartford, Conn. It was developed for the Navy's Bureau of Ordnance.

The recording tape in the device is led into a armored cylinder that withstands the shock of dashing into the ground, in the exhausted rocket, with little or no injury. Conventional paper tapes do not stand the shock. The new magnetic tape recorder may replace methods now in use by means of which automatic radio signals are sent from the missile to the ground because this method requires elaborate ground and air equipment, and difficulties are often encountered in both transmission and reception.

This magnetic recorder weighs only 46

pounds, but is able to record 200 pieces of information simultaneously and continuously on its six-inch tape. Such factors as air pressure, temperature, speed and many others are recorded by electrical signals from a score of instruments. When the record cylinder is recovered after the crash, the steel tape is played back through a transcriber and the information plotted on charts.

The magnetic tape recorder was developed by Armour Research Foundation of the Illinois Institute of Technology, Chicago, on sub-contract to United Aircraft Corporation as part of a guided missile project of the Navy Bureau of Ordnance. The project is cooperative, with the Massachusetts Institute of Technology acting as the technical control group for the associated manufacturers. These are United Aircraft, Bell Aircraft and Bendix Aviation Corporation.

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## ELECTRONICS

### Radio Microwaves Now Used To Measure Molecules

► RADIO microwaves, a fraction of an inch long, are being used to find the dimensions of certain molecules in gases and how fast they spin, General Electric scientists revealed in Schenectady, N. Y. The waves used vibrate about 24,000,000 times per second.

The technique used originated in 1933 by two University of Michigan scientists, according to Dr. A. Harry Sharbaugh, but did not become a practical tool until after the war. The recent great advances made in electronic devices for producing and controlling the tiny radio waves is accountable for the present practical development.

The waves are sent through a 16-foot rectangular tube containing the gas under study. Most of the time the radio waves pass through freely, but when they happen to be at one of the characteristic rates of the molecules, they are absorbed, and their energy sets the molecules into increased rotation. A dip in a horizontal green line on the face of a tube similar to that used to receive television pictures, watched by the scientists, shows absorption. Frequency is measured by comparison with a standard.

Dr. Sharbaugh explained that this microwave method of measuring molecules represents an important extension to the science of spectroscopy, used to study laboratory samples or the properties of distant stars. With visible light waves, about 50,000 to the inch, individual atoms can be studied. Infra-red waves, similar to light waves but invisible and longer, can be used in measuring molecules made of groups of atoms. The still longer radio microwaves yield data several thousand times more precise than those obtained with infra-red.

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## ENGINEERING

### Shock-Resistant Electron Tubes Being Developed

► RUGGED electron tubes for use in electronic equipment, that will withstand severe conditions of vibration, shock and acceleration, are under development at the National Bureau of Standards in Washington, D. C. Their development is an outgrowth of a project concerned with methods of testing tubes for sturdiness and durability.

Electronic equipment in various kinds of commercial, industrial and military applications is often subjected to severe mechanical abuse. Some tubes may have to withstand great extremes of temperature as well, but in any case the mechanical design of a rugged tube is strictly governed by the required electrical properties.

The first phase of the Bureau's work was a survey of actual operating conditions for electron tubes in various applications. Then came the development of equipment to reproduce the effects of the conditions encountered in use. The Bureau's facilities for testing the ruggedness of electron tubes now include vibration apparatus, mechanical resonance testers, high-impact shock machines, and high-speed centrifuges.

Vibrations produce the most common mechanical stress encountered by electron tubes under severe conditions, I. L. Cherrick of the Bureau staff states. Continuous and intermittent vibrations are present in vehicles, in aircraft, on shipboard and in industrial applications. In motor vehicles the vibrations are usually of low frequency, but in aircraft they may range up to 10,000 cycles per second.

Science News Letter, October 1, 1949

## BOTANY

### Treeless Prairies Believed Created by Indians

► THE treeless prairies, with the grass that supported the great herds of buffalo when the Indians dominated America, were actually made to order by the Indians to suit their way of life.

This new idea that the wild west landscape, as discovered by the white men, was not the natural vegetation of that region was suggested by Dr. Omer C. Stewart of the University of Colorado to the Twenty-ninth International Congress of Americanists held in New York.

The Indians had the habit of burning off the prairies to create fresher pasture for the game they hunted and to keep the country open so that they could see the approach of hostile tribes. Dr. Stewart believes that trees might have grown upon the midwestern plains except for this periodical burning by the pre-Columbian Indians.

Science News Letter, October 1, 1949