

CHEMISTRY

Light-Absorbing Pigments Give Off Vivid Colors

➤ YOU'LL be painting your house with "invisible sunlight" thanks to pigments that soak up light you can't see and give off vivid color.

Chemical research reported to the American Chemical Society meeting in Chicago by Dr. C. E. Barnett of the New Jersey Zinc Co., Palmerton, Pa., has increased tenfold the luminescent qualities of paint pigments.

During the war major improvements were made in materials that glow in the dark, and now the fact that some of these have "daylight fluorescence" is being applied to signs, soap and paint.

Ultraviolet light is absorbed on striking the materials and then emitted as visible color. The addition of this color to the normal reflection gives a more brilliant hue than can be obtained by reflection alone.

Science News Letter, May 1, 1948

CHEMISTRY

Sugar Can Be Made from Treated Oak Wood Waste

➤ HERE are some of the newest achievements of chemistry, reported to the American Chemical Society meeting in Chicago:

Sugar made from waste oak wood.

Sweeter molasses plus a sugar-cane by-product for soap production.

A new softener for some types of plastic from sour milk.

Cheaper alcohol for auto fuel.

Sugar can be made from oak wood waste, Dr. Elwin E. Harris of the Forest Products Laboratory, Madison, Wis., told the chemists. By treating it with a little sulfuric acid under steam pressure, it can be made to yield 45% sugar.

Sugar cane can be made to produce a by-product of use in synthetic soap making and the molasses will be sweeter as the result. R. J. Furse and Leon Godchaux II of New Orleans told of success in extracting the aconitic acid, which is also a softening agent for plastics and rubber.

Lactic acid, the tang of sour milk, can now change waste farm products into softeners for vinyl plastics products, a chemical team from the U. S. Department of Agriculture's Eastern Regional Research Laboratory, Philadelphia, reported. Dr. C. E. Rehberg, Marion B. Dixon and Philip E. Meiss explained that the agricultural products otherwise wasted would replace chemicals made

from oil, now in short supply.

A step toward cheaper use of alcohol for automobile fuel was reported by Dr. Donald F. Othmer of Brooklyn Polytechnic Institute, who told the chemists that the use of a new distillation process makes it just as cheap to produce absolute alcohol, 100% free from water, as the ordinary industrial alcohol which contains 5% water, interfering with its use as fuel.

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ENTOMOLOGY

Pin-Point Bombing Technic Developed to Kill Insects

➤ A PIN-POINT bombing technic, developed from Chemical Corps war research on poison gases, can now be applied to DDT destruction of disease-carrying mosquitoes and flies, Prof. Victor K. LaMer of Columbia University and Dr. Seymore Hochberg of Du Pont announced at the meeting in Chicago of the American Chemical Society.

The new technic involves use of an aerosol, or fine fog, of DDT solution. But the aerosol is made so that each droplet of DDT is exactly the right size to hit the body of mosquito or fly. Each droplet contains enough DDT to kill a single insect.

Larger droplets, like spray droplets, the scientists pointed out, fail to kill the insects because the droplets fall to the ground too quickly. Smaller ones are caught in the tiny air currents around each mosquito and flow around the insect without depositing on it. The mosquito is protected against these droplets by its streamlined body.

The ideal droplet size was found to be about 10 microns (four ten-thousandths of an inch) in diameter. It is achieved by a new generator invented by Prof. LaMer and Dr. Hochberg. Superheated steam catches and disperses droplets of oil-containing insecticide by passing the mixture through a tiny opening. Smoke screen generators in use before the war produced droplets which were too small and which also destroyed the DDT with heat.

Under favorable conditions, all mosquito life has been destroyed for more than a mile downwind from the fog generator with an outlay of only one pound of insecticide for every five acres of open country, the scientists reported.

By employing aerosols, or fine fogs, it is possible to kill mosquitoes and black flies, which are extremely susceptible to DDT, while birds, fish, bees, and other forms of animal life are left unharmed.

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IN SCIENCE

CHEMISTRY—NUTRITION

New Preservation Methods May Destroy Vitamins

➤ NEW methods of preserving food by bombarding it with X-rays, radar waves and electrons may destroy vitamins, necessary to high-quality diets, Prof. Bernard E. Proctor and Samuel A. Goldblith, of the Massachusetts Institute of Technology food technology laboratories, warned chemists at the American Chemical Society meeting in Chicago.

X-rays and electrons (cathode rays) destroy the organisms that cause spoilage in foods, without heating the food appreciably. But niacin, the anti-pellagra factor of the B-complex vitamins, is destroyed partially by X-rays and electrons.

The new electronic methods of preserving food are very promising because the food's natural flavor is retained.

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CHEMISTRY

Tastier Food Is Promise For Heart Patients

➤ THE food of heart disease patients won't have to lose its savor because a Brooklyn scientist has applied to water in the human body the same chemical trick that was used to desalt sea-water.

Dr. I. J. Greenblatt of Beth-El Hospital, Brooklyn, while serving in the Pacific area realized that the principle of the ion-exchange desalting emergency kits of planes and lifeboats could be applied to heart cases characterized by dropsy and swelling of the joints.

He and M. E. Gilwood of the Permuti Co., New York, told the American Chemical Society meeting in Chicago that three tablespoons of a synthetic plastic swallowed after and before meals seem to allow such cardiac cases to eat a more normal diet.

Saltless, tasteless diets largely of rice and starch have had to be the food of such heart cases. With doses of the new plastic, more normal food can be eaten as the material removes salt within the intestinal tract before it can get into the blood stream.

The ion exchange material used is a synthetic resin ground into tasteless powder grains coated with fatty chemicals and shellac.

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E FIELDS

VETERINARY MEDICINE

Worms May Clear Mystery Of How Diseases Spread

► THE mystery of how some diseases spread may be cleared through a lead reported at the meeting of the American Philosophical Society in Philadelphia.

Worms, Dr. Richard E. Shope of the Rockefeller Institute for Medical Research reported, spread the germs of at least three animal diseases.

The diseases are blackhead of turkey, salmon poisoning of dogs and influenza of swine.

Swine influenza is caused by the concerted activity of a bacterium and the swine influenza virus. The virus has as its intermediate host the common swine lung-worm.

It is believed, Dr. Shope said, that the three diseases now known to be spread by worms represent only a portion of a larger group. Further investigation should be made of worms as possible germ-carriers in diseases whose manner of spread is still not completely understood.

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MEDICINE

Radioactive Porphyrins Suggested as Cancer Aid

► A NEW method for cancer detection, that may also prove useful in cancer treatment, was described before the meeting of the American Association of Anatomists in Madison, Wis., by Dr. Frank H. J. Figge and Dr. Glenn S. Weiland of the University of Maryland school of medicine. Thus far, they have cautiously used it only on cancerous mice; but the principle seems capable of general application, and possibilities of its eventual extension to take in the field of human cancers is being investigated.

The compounds used by the Maryland researchers belong to the rather complex organic group known as the porphyrins. Porphyrins themselves are cancer-provokers, and they have an affinity for rapidly growing tissues anywhere. They tend to concentrate in such things as developing embryos and healing wounds, where their presence can be demonstrated through their red fluorescence

under ultraviolet light. Drs. Figge and Weiland injected porphyrins into cancerous mice, and later found the animals' tumors to be redly fluorescent.

With this demonstration of porphyrin concentration in cancers in hand, they now suggest the desirability of hitching radioactive metal atoms, like those of sodium, onto the porphyrin molecules. Increased radioactivity of any given part of the body would then be legitimate grounds for suspecting cancer; and possibly the radioactivity of the tracer element would in itself prove a helpful treatment of the condition.

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SEISMOLOGY

Man-Made Quake Waves Studied After Explosions

► SMALL, man-made earthquake waves have been recorded nearly 200 miles away from an explosion with sensitive new instruments developed by Carnegie Institution of Washington scientists.

The instruments are small, portable versions of the seismographs which register earthquakes. But the shocks are from the blast of hundreds of pounds of high explosives set off on the bottom of the Patuxent River near Washington.

Scientists conducting the experiments include Drs. M. A. Tuve, R. W. Goranson and J. W. Greig, and W. J. Rooney, J. B. Doak and J. L. England.

Explosions on the bottom of the Patuxent river have been set off at intervals for more than a year. Seconds after a blast, waves through the earth are recorded on the scientists' instruments at points at varying distances and directions from the explosion.

This new information is helping the Carnegie Institution scientists plot a unique map. It will show what the earth is like down to 30 miles under the nation's capital and nearby states.

In addition to the explosions in the Patuxent river, blasting in quarries in Maryland, Virginia, Pennsylvania and New Jersey have been recorded.

Thus far, Somerset, Pa., is the farthest point from the river explosions where the new instruments have detected the seismic waves, but the scientists believe that they can be used up to 250 miles.

Natural earthquakes have given science many clues about the earth below the surface, but tremors are too unpredictable for the systematic study of a region. Now, the Carnegie scientists are creating their own seismic waves for the new experiments.

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GENERAL SCIENCE

Revised Foundation Bill Approved by Committee

► A REVISED bill to establish a National Science Foundation has been approved by the Senate's Committee on Labor and Public Welfare.

The bill, which supporters of the proposed Foundation hope will be voted on by the Senate soon, now gives fewer powers to the nine-man executive committee than were listed in the original bill. Several of the functions and powers of the executive committee have been given to the full Foundation membership of 24.

Taken out of the bill by the Senate committee were specific provisions for special commissions on cancer, on heart and intravascular diseases and on poliomyelitis and other degenerative diseases. It is now stated simply that the Foundation may establish such special commissions as it deems necessary.

The bill was introduced in the Senate by a bipartisan group of Senators, while an identical measure is being sponsored in the House of Representatives by Rep. Charles A. Wolverton, R., N. J. The House bill has not yet been reported out of the Committee on Interstate and Foreign Commerce, of which Rep. Wolverton is chairman.

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CHEMISTRY

Wrinkle-Proof Cottons Soon To Be Available

► ALL types of cotton will soon be available that withstand summer wear without wrinkling because treated with a new finish which also controls shrinkage to a low limit. The finish will be known as Superset, and is a product of the American Cyanamid Company.

Wrinkle-resistant finishes have been widely used for rayon fabrics but up until now only heavy cotton could be treated with them because they seriously weaken the fabric. The new material causes little or no loss of tensile strength. The finish is effective after many severe test washings.

Melamine resin forms the basis of the new preparation. It has been modified in such a way that it does not affect the strength of the fabric. It is applied in the mills, and has been successfully tested in use with gingham, dress goods, prints, denims, corduroys, seersuckers and other types of cotton garment material.

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