

CHEMISTRY

Pesticide Detected in Food With New Machine

➤ A COMPACT instrument for detecting pesticide in food was announced in Cincinnati, Ohio.

A fraction of an ounce of suspected food is chopped up, dissolved and injected into the analyzer. Any contamination with insect-fighting chemical is detected and recorded on a chart as a peak. The size of the peak is proportional to the amount of insecticide, Hal Hartmann, Wilkens Instrument and Research, Inc., Walnut Creek, Calif., told the American Chemical Society meeting.

The technique is called gas chromatography, but the new "pestilyzer" has a special detector that is specifically sensitive to pesticide compounds. The instrument can analyze any pesticide, even if it is present only in the parts per billion range. It is not sensitive to other organic materials, which would otherwise have to be removed by messy and troublesome procedures.

The pestilyzer will provide the chemist with a powerful tool for analysis and control of pesticide residues in foods such as milk, beef, fruit, flour, etc. Through this means, state and Federal agencies will be given an adequate method of control.

• Science News Letter, 83:56 January 26, 1963

GEOLOGY

Lunar "Sea" Believed Found on Earth

➤ A SCIENTIST in San Diego, Calif., believes an asteroid crater in Canada was formed in the same manner as the lunar maria, called seas by the ancients because they look like dark areas on the moon.

Dr. Robert S. Dietz, U.S. Navy Electronics Laboratory, San Diego, Calif., said that this terrestrial equivalent to a moon sea is an explosion site he calls an astrobleme, meaning star-wound.

Dr. Dietz said that the asteroid, which struck the earth 1,700,000,000 years ago, caused a shock that triggered the rise of magma from the deep crust of the earth.

The explosion from the falling asteroid was equivalent to the detonation of three million megatons of TNT and blew out a crater 30 miles in diameter. The magma rising into the crater formed a saucer-shaped rock body, or lopolith. A crust of volcanic debris crusted over the lopolith and above this a lake was formed into which several thousand feet of sediment was deposited.

During the grenville time, a geological age about one billion years ago, the lopolith was compressed into its present oval form. Since then, the top has been leveled by erosion.

The asteroid, which fell at Sudbury, Ontario, deposited the largest known store of nickel in the world on Canadian soil and is the source of most of the world's nickel.

The nickel ore is found in sheets and tensional cracks in the wall of the explosion crater and lodged outside the periphery of the lopolith. Dr. Dietz said jokingly that although pennies apparently do not come from heaven, nickels do.

He said he has reinterpreted data collected on the Sudbury structure by scientists since 1883 to work out his concept of the earth-moon "seas." He believes lunar maria were formed in this same manner.

"Moon exploration" should be conducted here on earth, Dr. Dietz suggested, since there may be both lunar craters and a "lunar sea" on earth.

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ASTRONOMY

Smooth Surface Seen For Planet Venus

➤ THE PLANET VENUS has an extremely smooth surface, radar observations from earth indicate.

The surface of Venus is smoother even than the moon, which is believed to be much smoother than the earth. The radar observations of Venus were made by scientists at the National Bureau of Standards, using a large antenna near Lima, Peru, between Nov. 29 and Dec. 7.

The mass of data, when fully analyzed, may also yield information on the rotation of Venus, which is now believed to be very slow and possibly in a direction opposite from that of earth. The radio pulse echoes obtained are of a type and duration unlike any others.

Preliminary study of the records shows that echoes from pulses three-thousandths of a second long occur as quite sharply defined bursts, or "glints." Pulses half a thousandth of a second long give almost no echoes except from the "specular point," which is the point on the planet's surface lying closest to earth.

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ENTOMOLOGY

Honey Bees Use Sound To Transmit Information

➤ THAT HONEY BEES can perceive sound and use it to transmit information was shown for the first time recently in studies performed at the University of California in Santa Barbara.

By reproducing the "piping" sound of a free virgin queen bee artificially, a response was obtained from a caged virgin queen, similar to that produced by a queen forcibly contained in her cell by worker bees. Dr. Adrian M. Wenner of the University of California at Santa Barbara created the sound electronically and played it through a small loudspeaker attached to the hive. The characteristic pattern was reproduced with a telegraph key.

The experiments indicated that the bees respond most often to sounds with frequencies between 600 and 2,000 cycles per second, which means that the harmonics of the bees' tone are predominant, rather than the fundamental, which is only 430 cycles per second.

Results showed that a certain kind of sound pattern is required for a given response, thereby proving that bees exchange information by means of sound waves.

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IN SCIEN

ZOOLOGY

Fish Sounds Are On the Record

➤ CHARACTERISTIC grunts, croaks, coughs and drums of 300 underwater species have been recorded. Burrfish cough, sea robins cluck like hens, oyster toadfishes whistle, while flounders are mute, reports Dr. Marie Fish, biological oceanographer of the Narragansett Marine Laboratory, Rhode Island. Sounds of marine fish, mammals and invertebrates are made in response to mating, defense and hunger urges. Many species have characteristic sounds which can be recognized. The tape recordings played by Dr. Fish were made of noisy fish going through their daily underwater routine in the Chesapeake Bay and the lower Patuxent River.

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CHEMISTRY

Chemical in Beef Blood Gives "Staph" Immunity

➤ AN UNIDENTIFIED chemical in beef blood extract can give mice immunity to penicillin-resistant "staph" infections.

Experimental mice have survived lethal doses of staphylococcus germs after being treated with small amounts of unpurified beef extract, Bernd Kroenberg told the American Chemical Society meeting in Cincinnati, Ohio.

This work is of special interest in view of the ever-increasing antibiotic resistance acquired by the staph germs in hospitals all over the world. The unending race against this resistance is a cause for great concern.

The chemical in the extract responsible for the immunity has not yet been isolated, but by using a special device, material was separated that had a 50- to 100-fold higher activity than the original extract. Identification of the chemical will be "complicated," Mr. Kroenberg, a doctoral candidate at Institutum Divi Thomae, Cincinnati, said.

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TECHNOLOGY

Fluid Control of Processes and Machines

➤ LIQUIDS and gases can join electricity in delicate control of processes and machines as the result of a way of making fine and precise channels in glass devised by Corning Glass Works, Corning, N. Y., working with the Army's Harry Diamond Laboratories. Designs are transferred to glass optically and then etched to form channels, chambers, ports and holes, which are covered by a plate fused to form a monolithic structure.

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CE FIELDS

TECHNOLOGY

Tiny Circuits Cut and Welded by Electron Beam

► A NEW ELECTRON beam machine cuts, drills and welds circuits so minute that they fit on wafers no thicker than a fingernail.

The electron cutter-welder works like a gun, shooting electrons on a surface with a power of 10 billion watts per square inch. Highly accurate, the machine which works on all metallic materials and glass can be beamed to a spot less than five ten-thousandths of an inch. The operator views progress through binocular lenses which magnify the work area about 14 to 40 times.

The manufacturer is Hamilton Standard division of United Aircraft Corporation.

• Science News Letter, 83:57 January 26, 1963

OCEANOGRAPHY

Ocean Rivers Measured By Deep-Sea Devices

► SUBMERGED oceanic rivers will be measured by deep-sea current metering devices.

Periodic recordings will be made of date, time of day, depth, velocity and direction of water flow. The measuring devices, which resemble oil cans, can be lowered to a depth of seven miles and operate for a month. Data are collected on 16 mm photographic film, one frame exposed every 10 minutes. The new instruments were developed by the General Dynamics Corporation.

• Science News Letter, 83:57 January 26, 1963

GEOLOGY

Earth's Crust Found Thicker in Colorado

► THE EARTH'S CRUST is 30 miles thick in eastern Colorado, only 10 miles thick in the fertile central valley of California.

It is 20 miles thick in the high mountains of central Nevada, a symposium on the structure of the earth's crust in the western United States was told in Denver. This new knowledge resulted from seismic probings of the earth's interior by underground nuclear and conventional explosions.

The explosions are part of the Vela Uniform program to find ways to detect, locate and identify underground nuclear explosions. To do this, the structure of the earth's crust must be known to determine the paths seismic waves travel from an explosion to different points on the earth's surface and how long the waves take to travel these paths.

The detailed study of the crust's structure in the West was under the direction of L. C. Pakiser of the Interior Department's Geological Survey. He said that the new infor-

mation about the crust was based on a network of about 2,000 recordings of seismic waves from underground nuclear and conventional explosions.

The network extends from eastern Colorado to the California coastline, and from central Idaho to the Mexican border.

The thickest part of the crust being studied, Mr. Pakiser reported, is probably under the Colorado Rockies, where it may extend down as far as 40 miles.

• Science News Letter, 83:57 January 26, 1963

BIOCHEMISTRY

New Drug Tests Possible Using One-Cell Organism

► NEW DRUGS in the future can be tried on protozoa, single-celled organisms, before they are tested for bad effects on higher animals or man.

Thalidomide, which causes malformed babies when taken by pregnant women, has been found to inhibit the growth of some protozoa. This discovery prompts the suggestion that the cheap, easily grown minute creatures could be used for rapid, sensitive and inexpensive evaluation of potential drug toxicity. After this initial screening, tests might be done on higher species.

A way to counteract the growth inhibition in the microorganisms was discovered through use of nicotinic acid and related compounds and vitamin K, which promotes clotting of blood.

How thalidomide causes congenital malformations is so far unknown, but if results of testing microbes should apply to man, the drug might interfere with cellular oxidation during the beginning of life and cause abnormalities.

Six researchers at Seton Hall College of Medicine, Jersey City, N. J., Roosevelt Hospital and Haskins Laboratories, New York, reporting metabolic deficiencies in protozoa induced by thalidomide, in *Science*, 139:110, 1963, said their tests indicated that thalidomide may possibly act at the point where nicotinic acid is synthesized to nicotinamide adenine dinucleotide (NAD). Or it may interfere with the use of NAD and vitamin K in cellular oxidations.

Drs. Oscar Frank, Herman Baker, Herman Ziffer, Sheldon Aaronson, S. H. Hutner and C. M. Leevy reported this study. Tests with protozoa are underway in other laboratories.

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TECHNOLOGY

Side and Rear Fender Lights Fight Road Glare

► GLARE that stops autoists from seeing dangers on the road at night is neutralized by a new type of road lighting devised by Dr. Merrill J. Allen of Indiana University, Bloomington.

By means of auxiliary lights on the front bumper of a car which are directed to the road beside and behind it, the objects blacked out by the glare of an approaching car's headlights are made visible. Conventional sealed beam headlights are used.

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BIOLOGY

Tiny Yeasts Survive 50 Years in Antarctica

► TINY LIVING THINGS—yeasts, molds and bacteria—survived more than a half a century in a frozen food cache left in Antarctica by an ill-fated British expedition to the South Pole.

Material from a one-pound bottle of bakers' yeast was grown at the University of Texas, Austin, by Drs. George H. Meyer, Marie B. Morrow and Orville Wyss. It was divided into five parts from which cultures of two types of yeasts, two kinds of molds and three species of bacteria were grown.

Entire cultures of bacteria and yeast were developed from the lower three layers of the material.

The food cache, in which the jar of yeast was found, was left by the expedition of Capt. Robert Falcon Scott of the British Royal Navy in his expedition of 1911.

The research was reported in *Nature*, 196:598, 1962.

• Science News Letter, 83:57 January 26, 1963

CONSERVATION

Ducks Poisoned by Eating Shotgun Pellets

► LEAD POISONING kills an estimated four per cent of the total duck population each year, but the poisoning is caused by eating shotgun pellets and not by pellets buried in the flesh as a result of wounding by hunters, according to Wisconsin Conservation Department researchers.

The ducks mistake the lead shot for small stones and grit, which they eat and store in the gizzard for grinding up seeds and other hard foods. The digestive juices then act on the lead, forming toxic compounds that can cause sickness and death.

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ENTOMOLOGY

Citrus Mites Not Stopped By Florida Freeze

► FLORIDA'S December freeze, which ruined most of the citrus fruit crop, did not kill directly Texas citrus mites, major insect pests.

The drying and dropping of leaves and fruit removed some of the pests from the trees, but entomologists are not optimistic that the weather misfortune will reduce the pests to any large extent.

Severe damage by subterranean termites to homes around Christmas time is reported to the U.S. Department of Agriculture from Arizona's Salt River Valley.

Extensive warfare against cattle-damaging screwworms is reported from along the Mexican border of Texas and Arizona. More than 64 million screwworm flies made sterile by radiation were released in early December so that production of another generation will be interrupted. Airplanes are scattering 600 sterile flies each week over each of 100,000 square miles to provide a barrier zone against invasion from Mexico.

• Science News Letter, 83:57 January 26, 1963